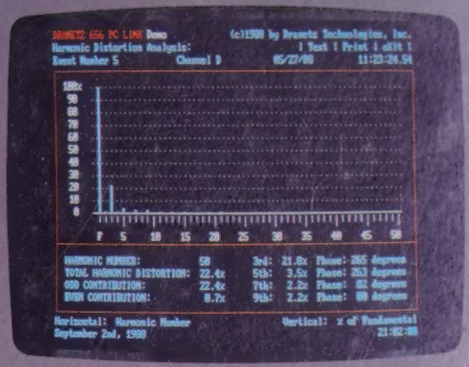
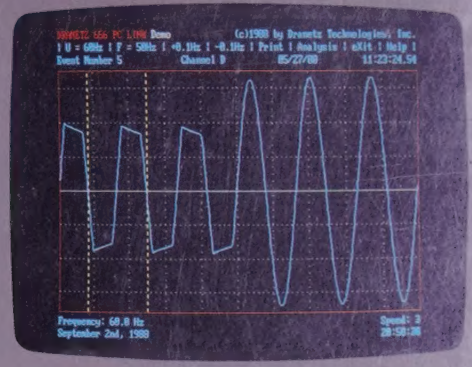
Graphical and Harmonic Analysis Software Package

Series 65

Rev. E





TM-113522
Rev. E

DRANETZ 656 GRAPHICAL & HARMONIC ANALYSIS SOFTWARE

656-OS-2001 OPERATOR'S GUIDE

This manual supports software Versions 1.2 and 2.0

Dranetz Technologies, Inc.
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If you ever have any problems using this program, contact Dranetz Customer Service Department for assistance:

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Edison, NJ 08818-4018

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TWX Number: (710) 997-9553
Telex Number: 499-7808
Cable: DRANETZ

Weekdays, 7:30 a.m. to 5:00 p.m. EST

NOTE: The ordering part number for the complete software package is P/N 656-0S-2001.

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Important Notice

This package contains two versions of Dranetz Graphical and Harmonic Analysis software.

656-OS-2001 Version 1.2
656GHA
for use with data collected with a
Dranetz 656 Disturbance Waveform Analyzer

656-OS-2001 Version 2.0
656AGHA
for use with data collected with a
Dranetz 656A Disturbance Waveform Analyzer

For data recorded on 656 Analyzers, use Version 1.2 of the software. Use the 656 Graphical and Harmonic Analysis Software Manual without Appendix C.

For data recorded on 656A Analyzers, use Version 2.0 of the software. Use the 656 Graphical and Harmonic Analysis Software Manual for basic operation of the program, and refer to Appendix C for features unique to Version 2.0 of the software.

When analyzing data from both 656 and 656A Analyzers, use both versions of the software and treat them as two separate programs. Both versions can be placed in the same directory; the data from each version is placed in a separate subdirectory. The two databases are not interchangeable.

Compatibility Table

656 (Program V 1.43)	←----------→	656GHA Version 1.2
656A (Program V 2.0)	←----------→	656AGHA Version 2.0

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GENERAL

Welcome to the Dranetz 656 Graphical and Harmonic Analysis software package. You are reading the Operator's Guide for the software program which lets you transfer the disturbances recorded by the Series 656 Disturbance Waveform Analyzer† to a personal computer for detailed viewing and analysis. The events and related data, including any harmonic distortion analysis, can be printed and integrated into site survey reports.

The transfer of the event memory can be performed remotely using modems, locally using an RS-232 cable (direct serial connection), or directly from a 656 Disk.

The Dranetz 656 Graphical and Harmonic Analysis Software is intended for use on an IBM AT or PS/2 (model 30 or 50). While the program may also run on another fully compatible personal computer, Dranetz does not guarantee its performance in non-IBM machines). The program is completely menu-driven, and is designed for users who don't have specialized knowledge of computers and communications.

HOW TO USE THIS MANUAL

The manual is divided into 4 main divisions: INTRODUCTION, SAMPLE SESSION, REFERENCE, and APPENDICES. At the beginning of each division, a table of contents lists the material covered in that division. An index is included for your convenience.

SELECTING OPTIONS

Since the Dranetz 656 Graphical and Harmonic Analysis Software program is menu driven, operating the program involves selecting an option from the various program menus. There are different ways of selecting an option from these menus, depending on the type of menu you are selecting from and whether you are using a mouse or the keyboard. Throughout this manual, the term "select" indicates all of the steps involved in selecting a particular option.

For more detail concerning operating the program with either a mouse or from the keyboard, refer to the subsection on "Using the Menus" in the REFERENCE section of this manual.

SPECIAL KEYS

Special keys will appear in the manual italicized and in brackets such as <*ESC*> for the "ESCAPE" key and <*ENTER*> for the "ENTER" or "RETURN" key.

†Throughout this manual, the term 656 will refer to either the Dranetz Series 656 or Dranetz Series 656A Disturbance Waveform Analyzer.

ENTERING TEXT

Whenever you are required to type in a string of text, you are prompted with the letters, numbers, and characters to be typed in boldface. For example:

Type: **656GHA**

TERMINOLOGY

PC or Personal Computer

The Dranetz 656 Graphical and Harmonic Analysis Software is designed to operate on the IBM AT or PS/2 (model 30 or 50). The terms "PC" and "Personal Computer" will be used throughout this manual to indicate any or all of these models. When it is necessary to distinguish between these models, the particular model being distinguished is indicated.

656 Disk

The term "656 Disk" refers to the 3½ inch data diskette from the Series 656.

NOTE

If the 656 Disk has been saved with software prior to Version 1.42, the error message "Invalid 656 disk: incorrect data format." may appear when data is being converted to the computer's data base. If this occurs, you must reload the data into a 656 running software Version 1.42 or 1.43, and then re-save the data to the disk. This will correct this condition, making the data compatible with the Graphical and Harmonic Analysis program.

Program Disk

The term "Program Disk" refers to the backed up version of the Dranetz 656 Graphical and Harmonic Analysis Software diskette used to run the program from a double diskette system.

PC Data Disk

The term "PC Data Disk" refers to the diskettes storing the Series 656 data if you are using a double diskette system.

WHAT YOU MUST ALREADY KNOW

To run the Dranetz 656 Graphical and Harmonic Analysis Software, you must have working knowledge of the 656.

A basic familiarity with the Personal Computer and an Epson® compatible printer† is assumed. If using a mouse, you should be familiar with its basic operation.

†Or a Hewlett Packard ThinkJet. See Appendix D.

INCLUDED IN THIS PACKAGE

The following items are included in this package:

Quantity	Description
1	Diskette Package for Software Version 1.2, including: 1 5¼ inch program diskette 1 3½ inch program diskette 1 656 system diskette, V1.43 (labeled 656 Program)
1	Diskette Package for Software Version 2.0, including: 1 5¼ inch program diskette 1 3½ inch program diskette
1	Operator's Guide (TM-112522)
1	RS-232 cable (P/N 113376-G1) for connection between the PC and the Series 656. (Can also be used to connect the PC and the Hayes Smartmodem®.)

If any of the above items are missing from your package, please contact Dranetz Sales Department immediately at Telephone (201) 287-3680 or FAX (201) 287-8627.

REQUIRED EQUIPMENT

To run the Dranetz 656 Graphical and Harmonic Analysis Software, an IBM Personal Computer (AT or PS/2 model 30 or 50) with the following features is required:

- Two double sided disk drives or one double sided disk drive and one hard disk (20Mb minimum is recommended)
- One available serial port† AND/OR one 3½ inch disk drive‡
- Graphics monitor (either monochrome or color)
- CGA graphics card or EGA graphics card (256K of memory recommended for optimum viewing resolution and color display--refer to Appendix B)
- Minimum of 640K of random access memory (RAM)
- Disk operating system MS/PC DOS, Version 3.xx

†For connection between the Personal Computer and the 656 or for connection between the Personal Computer and the modem (cable provided).
‡Required to read data directly from 656 Disk.

OPTIONAL EQUIPMENT

The following equipment is optional for running the Dranetz 656 Graphical and Harmonic Analysis Software:

- An Epson FX® or compatible Epson® printer, an IBM Graphics Printer, or a Hewlett Packard ThinkJet.
- Two Hayes Model 1200 (external) Smartmodems® OR one Hayes Model 1200 Smartmodem® and one 1200B (internal) Smartmodem®: one for the remote 656 and one for the PC. (Required for remote access to the 656 if not using the serial port connection.)
- Dranetz cable P/N 113446-G1 for connecting Hayes Modem to remote 656
- Microsoft Mouse with Mouse Driver Version 6.11 or higher
- A math co-processor (8087, 80287, 80387). Check your PC user's manual for the model required by your computer
- A 9-to-25 pin adapter for converting a 9-pin serial port to 25-pin RS-232 cable compatibility (if needed)

INSTALLATION INSTRUCTIONS

Copy all files from the master Program Disk to the hard disk or to the working Program Disk (depending on the hardware being used).

A data subdirectory is automatically created (if it does not already exist) by the program when the first data file is created.

If running the program on a double diskette system, use a formatted diskette to store data. This is your PC Data Disk.

SPECIAL NOTES

A Series 656 program disk is included in this package for complete compatibility between the 656 and the Dranetz 656 Graphical and Harmonic Analysis Software. It is recommended that you replace the old software version in all of your 656s to take advantage of the Remote Communications and Monitoring features available with the Dranetz 656 Graphical and Harmonic Analysis Software.

If the 656 Disk has been saved with software prior to Version 1.42, the error message "Invalid 656 disk: incorrect data format." may appear when data is being converted to the computer's data base. If this occurs, you must reload the data into a 656 running software Version 1.42 or 1.43, and then re-save the data to the disk. This will correct this condition, making the data compatible with the Graphical and Harmonic Analysis program.

If you are using a double diskette system with two different size disk drives, and you wish to read information from a 656 Disk, be aware that the 656 Disk can only be read from the 3½ inch drive. Therefore, the program has to be running from the other size drive. Since the drive you are running the program from is the same drive the program writes to, the Program and PC Data Disks must be the same size.

If you are using the program on a computer with a monochrome monitor, type: **656GHA /B** rather than **656GHA**† to run the program in monochrome mode.

When running the Graphical and Harmonic Analysis software, the frequency setting for performing harmonics can be adjusted between 45 and 65 Hz. The normal default setting is 60 Hz (which is the standard frequency in the U.S.). This can be changed when invoking the program to any setting between 45 and 65 Hz by adding the option to the command line. The format for the default frequency option is a slash followed by the letter "F" followed by a colon (":"), followed by the desired frequency. For example, to invoke the program with a default frequency of 45 Hz, type: **656GHA /F:45** (or **656AGHA /F:45** if running Version 2.0) and press <*ENTER*>. Once the program is running the frequency can be changed for any event. The new setting becomes the new default frequency.

DO NOT use any Terminate-and-Stay-Resident programs (also known as Memory Resident programs) as they take up room on your PC's RAM. They may also cause other interference with the operation of the Dranetz 656 Graphical and Harmonic Analysis Software.

†If using Version 2.0 of the software, use "656AGHA /B" instead of "656AGHA".

SAMPLE SESSION

BEGINNING THE SESSION

GETTING FILES

FROM 656 DISK

HANDLING EVENTS

PLOT GRAPHIC SUMMARIES

VIEW EVENTS

HARMONIC ANALYSIS

ENDING THE SESSION

BEGINNING THE SESSION

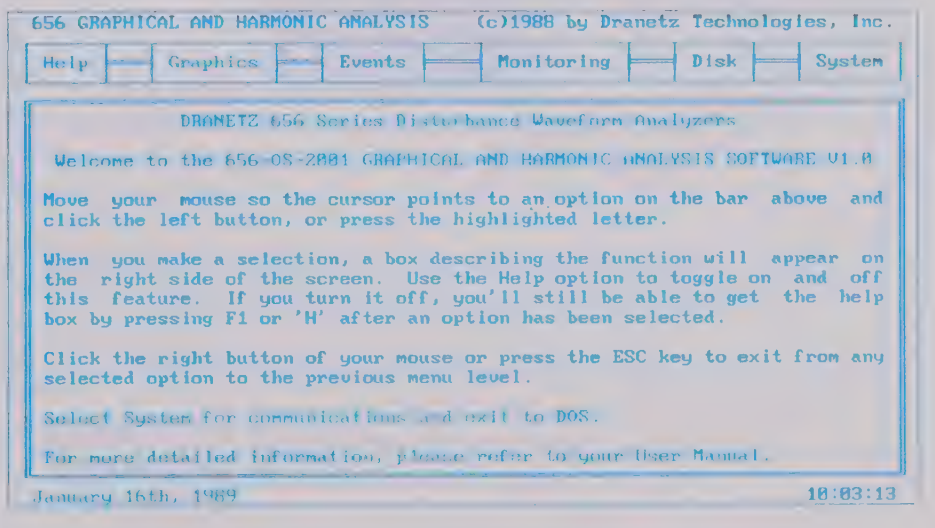
The following subsections take you through an operating session of the Dranetz 656 Graphical and Harmonic Analysis Software from beginning to end. If you need information on using the mouse or on any of the other menu selections, including remote communications, see the REFERENCE section of this manual.

There are some differences between using a hard disk system and using a double diskette system. When necessary, these differences are pointed out.

From the drive and directory that the program is located in, type **656GHA** (or **656AGHA** if running Version 2.0) and press <*ENTER*>.

The program begins and you are presented with the Main Menu:

Main Menu


656 GRAPHICAL AND HARMONIC ANALYSIS (c)1988 by Dranetz Technologies, Inc.
Help
Graphics
Events
Monitoring
Disk
System
DRANETZ 656 Series Disturbance Waveform Analyzers
Welcome to the 656-OS-2001 GRAPHICAL AND HARMONIC ANALYSIS SOFTWARE V1.0
Move your mouse so the cursor points to an option on the bar above and click the left button, or press the highlighted letter.
When you make a selection, a box describing the function will appear on the right side of the screen. Use the Help option to toggle on and off this feature. If you turn it off, you'll still be able to get the help box by pressing F1 or 'H' after an option has been selected.
Click the right button of your mouse or press the ESC key to exit from any selected option to the previous menu level.
Select System for communications and exit to DOS.
For more detailed information, please refer to your User Manual.
January 16th, 1989
10:03:13

If you are running the program from a double diskette system, remove the Program Disk at this time and replace it with the PC Data Disk.

GETTING FILES

To view and analyze event data, the data must first be retrieved from the event memory of the 656 and placed in a location file. This can be done in one of several ways, depending on the type of configuration you have set up.

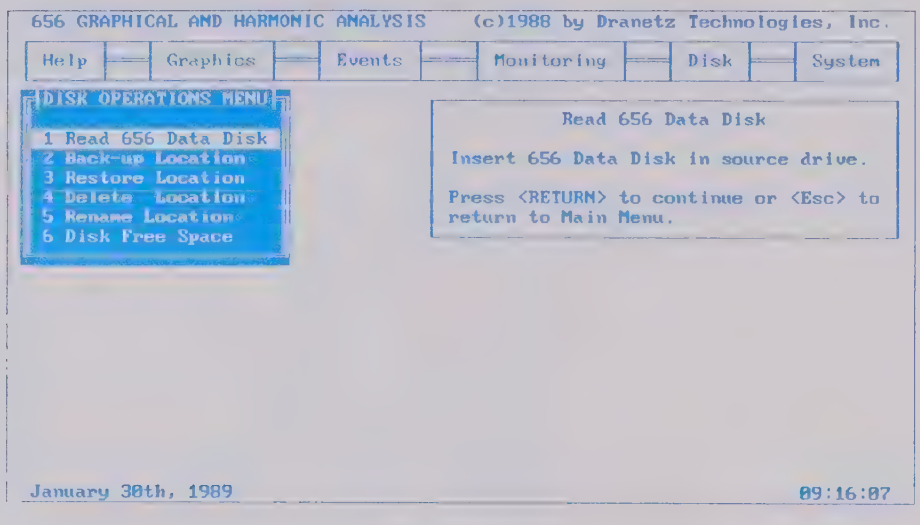
The remote communications menu (under the "Systems" option from the Main Menu) allows the transfer of data using either a direct or modem connection. This type of data transfer is discussed in the REFERENCE section of this manual.

FROM 656 DISK

If you have a 3½ inch drive, data can be imported directly from the 656 Disk using the Disk Operations Menu. The Dranetz 656 Graphical and Harmonic Analysis Software re-configures the data to a form your PC can read. This type of data transfer takes only a few minutes, and is therefore preferable to the remote communications type of data transfer.

Select "Disk" from the Main Menu. The Disk Operations Menu appears:

Disk Operations Menu



Select option number 1, "Read 656 Disk". Insert the 656 Disk into the appropriate Drive† and press *<ENTER>*.

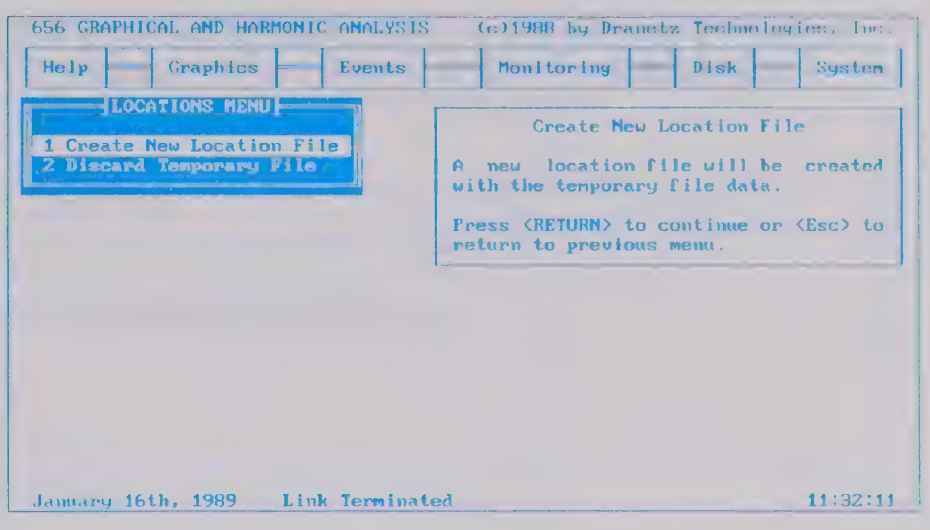
The transfer of data to a temporary file takes only a few minutes, even if the data file is very large. When the transfer is complete the Locations Menu appears (top of next page).

Select option number 1, "Create New Location File". When prompted for a file name, enter a name (up to 42 characters long) that will help you know which 656 the data was from. All files from that particular unit should have the same name, since the date will distinguish them. The file is automatically assigned the 656 system date at the time the data was saved to the 656 Data Disk.‡ The files will appear in alphabetical and chronological order in the Locations List.

†If using a double diskette system, make sure that your PC Data Disk is in the proper drive before beginning the transfer. DO NOT try to copy the file onto your Program Disk.

‡If the disk being read in is from an older version of 656 software (before V1.42), the PC system date at the time the 656 disk is read in is used.

Locations Menu



HANDLING EVENTS

Once a file has been transferred to a location file, you can view, analyze, and print out the various events in the file. Events are arranged sequentially, but can be grouped by type of event and channel for plotting.

Selecting either "Graphics" or "Events" from the Main Menu allows you to view individual events.

With the "Graphics" choice, you first choose the type of event and the channel you wish to plot. From the graphic summary plot, you can select a smaller time span to plot, change the channel of events on the plot, or view individual events.

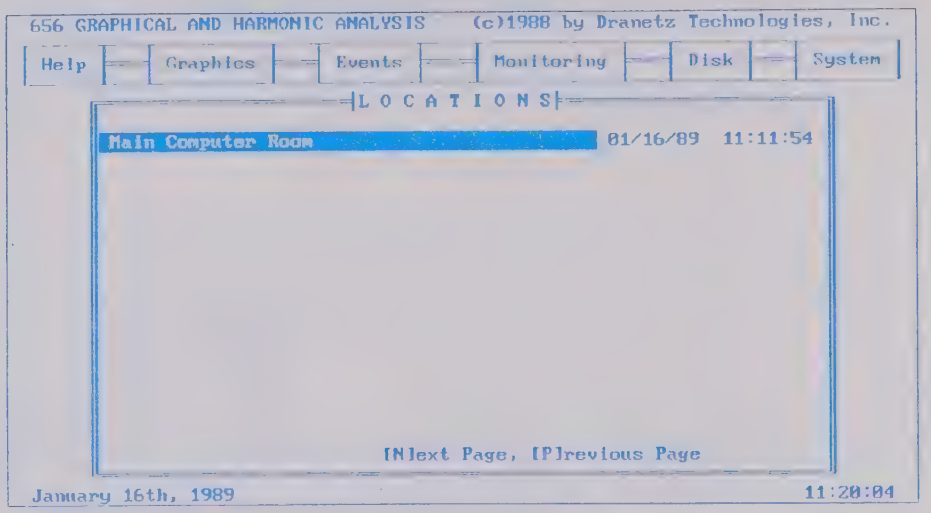
With the "Events" choice, you can access any of the events in the same manner as you would with the 656: either by date or by event number.

Once viewing the individual events, both options are identical, allowing you to page through all of the events in the file, or allowing you to jump to any particular event number.

PLOT GRAPHIC SUMMARIES

Select "Graphics" from the Main Menu. The Locations List appears listing the available data files, including the file you just transferred from the 656 Data Disk:

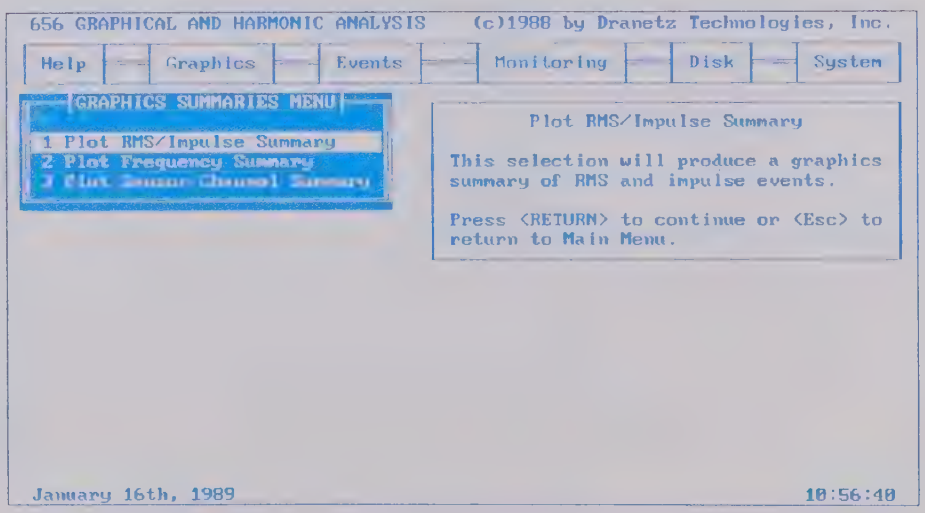
Locations List



If more than one file exists on your data directory, the files are listed in alphabetical and chronological order. Select the file you wish to view.

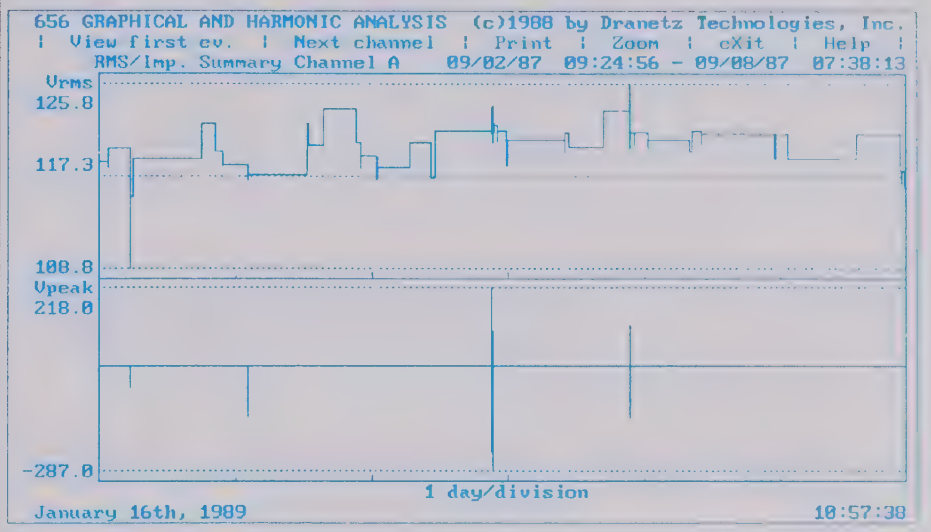
The Graphics Menu appears next, letting you choose between RMS, impulse, and frequency:

Graphics Menu



After you make your selection, a spectrum of the events† you chose appears on the screen. (If the type of events you chose does not exist on the file, a message appears telling you so.):

Graphics Screen



The bottom line of the screen tells you what type of increments (days, weeks, months, hours, etc.) the spectrum is broken down into, depending on the file size.

From the Graphics Screen Menu, select "Next channel" to view a graph of all the events recorded on another channel. (If there are no events on any of the other channels, the current graph does not change.)

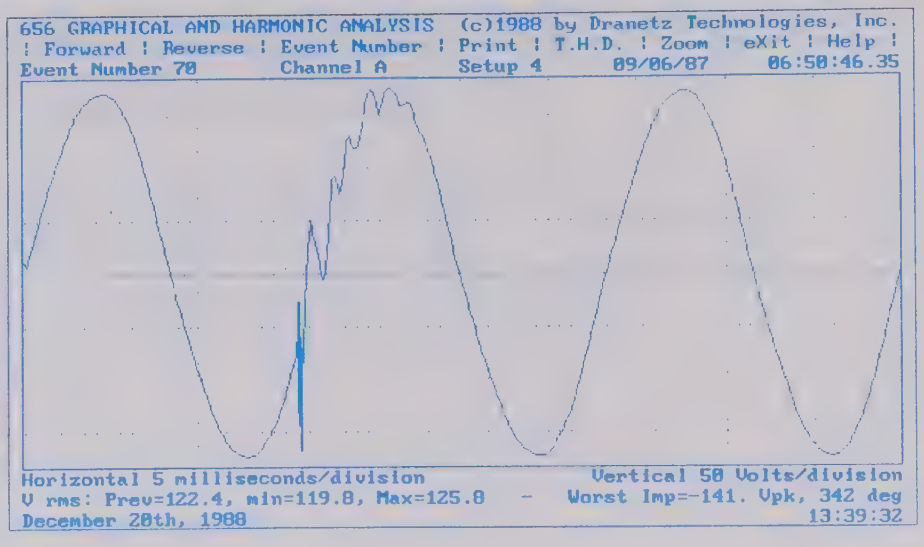
You can zoom‡ in on more specific time periods, down to as specific as individual minutes. (Each division is then equivalent to ten seconds.) Select "Zoom" from the Graphic Screen Menu. Two vertical markers appear which define the zoom window. Move the markers to define a time span for the new time plot. Select "Zoom" a second time. The markers disappear and the area that was contained between the two markers now takes up the full screen.

VIEW EVENTS

Select "View first ev." from the Graphics Screen Menu to view the individual events contained within the time plot displayed on the screen. The first event to be displayed is the first one occurring in the time plot.

†All the events of the type you specified on the file are included in this first spectrum. You can then narrow down the time period.
‡If you are not familiar with "zooming", refer to the help screens or the appropriate subsection in this manual.

Event Screen


656 GRAPHICAL AND HARMONIC ANALYSIS (c)1988 by Dranetz Technologies, Inc.
! Forward ! Reverse ! Event Number ! Print ! T.H.D. ! Zoom ! eXit ! Help !
Event Number 70 Channel A Setup 4 09/06/87 06:50:46.35
Horizontal 5 milliseconds/division Vertical 50 Volts/division
V rms: Prev=122.4, min=119.8, Max=125.8 - Worst Imp=-141. Vpk, 342 deg
December 20th, 1988 13:39:32

You can page forward or reverse, and view all of the events in their sequential order. Page through the event file until a waveform event is displayed on the screen.

HARMONIC ANALYSIS

A Harmonic Analysis computes and displays the percent and phase shift of harmonic distortion on the waveform. To perform the Harmonic Analysis, you must isolate one complete line frequency cycle Best results are obtained when the cycle starts at the zero crossing.

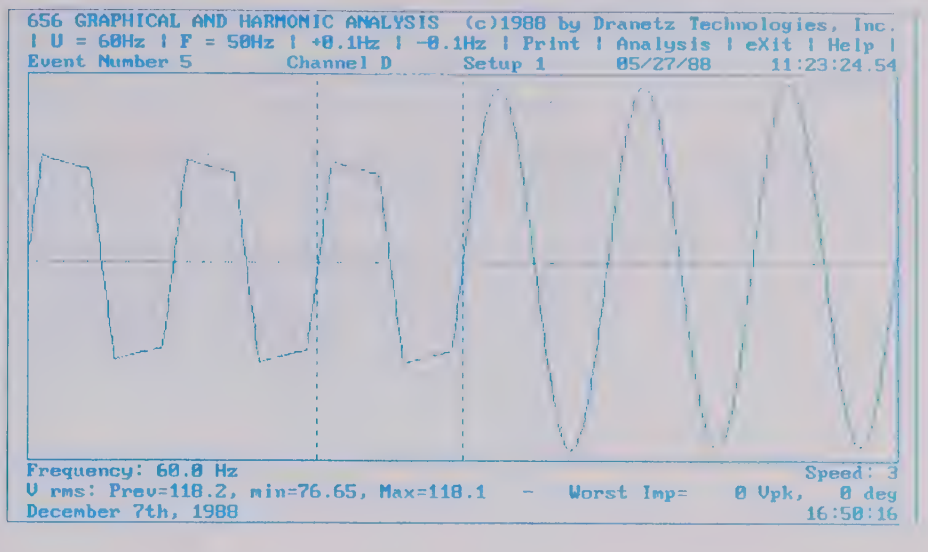
Select "T.H.D." to view the Harmonic Selection Screen.†

The Harmonic Selection Screen is similar to the Event Screen, with the Harmonic Menu replacing the Event Screen Menu. The complete waveform is displayed on the screen, and two vertical dashed lines (markers) appear over the waveform. These two markers define a window which determines the area or cycle to be used for the harmonic analysis. Moving the left marker moves the entire window. Moving the right marker changes the size of the window (changes the frequency).

Move the left marker so it is located at the first zero crossing of the line frequency cycle. Make sure the right marker is positioned where the cycle ends (at the **third** zero crossing). Use the Mouse or the cursor keys to move the left marker. Use the mouse or the "+" and "−" selections from the Harmonic Selection Menu to move the right marker in 0.1Hz increments.

†If the event is a single cycle, you skip the Harmonic Selection Screen and go right to the Harmonic Analysis Screen. With a single cycle event the default frequency is used.

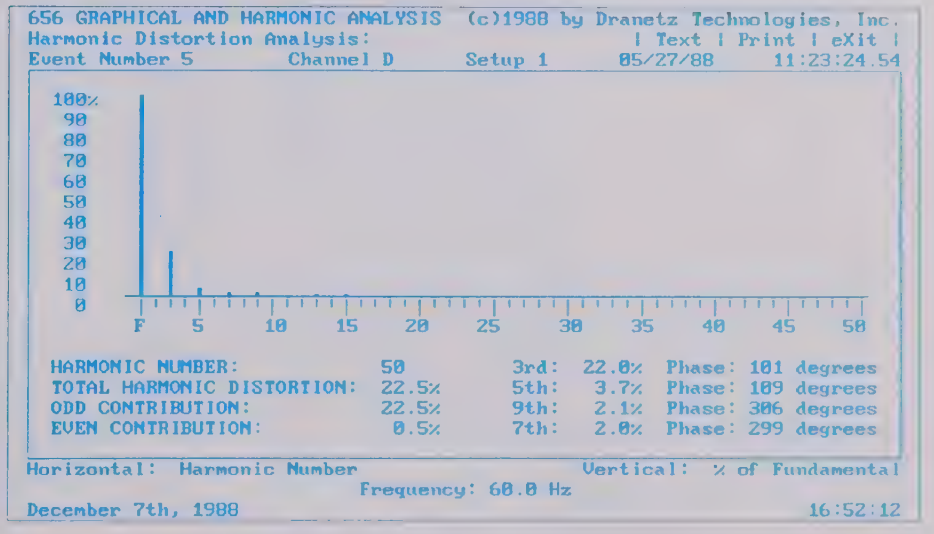
Harmonic Selection Screen


656 GRAPHICAL AND HARMONIC ANALYSIS (c)1988 by Dranetz Technologies, Inc.
| U = 60Hz | F = 50Hz | +0.1Hz | -0.1Hz | Print | Analysis | eXit | Help |
Event Number 5 Channel D Setup 1 05/27/88 11:23:24.54
Frequency: 60.0 Hz
Speed: 3
V rms: Prev=118.2, min=76.65, Max=118.1 - Worst Imp= 0 Vpk, 0 deg
December 7th, 1988
16:50:16

The frequency (displayed at the bottom of the screen) corresponds with the frequency of the recorded event. The default is 60 Hz.

Once you have defined the cycle to analyze, select "Analyze" from the Harmonic Menu. The program now performs an analysis from the first (fundamental) to the 50th harmonic and the following screen appears:

Harmonic Analysis Screen



The graph shows the amplitude of each harmonic. The text below the graph displays the number of the last harmonic analyzed, the total harmonic distortion, the even and odd contribution to this total distortion, and the four harmonics where the most distortion occurred, along with their amplitude and the degree of their phase shift.

Select "Print". If your printer is hooked up to your PC and loaded and press <*ENTER*>. If your printer is not hooked up, type in a file name and press <*ENTER*>. You are prompted to save the file in a ".GRA" format, or reduced or full ".PCX" format. Press <*G*> to save the file in a format which can be printed out later without a separate program.

Select "Text". The Harmonic Text Screen appears, displaying the percent of amplitude and phase shift of each harmonic with respect to the fundamental.

Harmonic Text Screen

656 GRAPHICAL AND HARMONIC ANALYSIS (c)1988 by Dranetz Technologies, Inc.
Harmonic Distortion Analysis: ! Print ! eXit !
Event Number 5 Channel D Setup 1 05/27/88 11:23:24.54

Fund: 63.5 Volts	2nd: 0.3%, 182 deg	3rd: 22.0%, 101 deg
4th: 0.2%, 238 deg	5th: 3.7%, 109 deg	6th: 0.2%, 287 deg
7th: 2.0%, 299 deg	8th: 0.1%, 4 deg	9th: 2.1%, 306 deg
10th: 0.0%, 226 deg	11th: 0.4%, 311 deg	12th: 0.1%, 192 deg
13th: 0.8%, 149 deg	14th: 0.1%, 232 deg	15th: 0.7%, 157 deg
16th: 0.1%, 256 deg	17th: 0.1%, 184 deg	18th: 0.0%, 349 deg
19th: 0.4%, 352 deg	20th: 0.1%, 33 deg	21st: 0.3%, 0 deg
22nd: 0.0%, 61 deg	23rd: 0.0%, 227 deg	24th: 0.0%, 42 deg
25th: 0.3%, 198 deg	26th: 0.0%, 27 deg	27th: 0.2%, 218 deg
28th: 0.0%, 174 deg	29th: 0.1%, 321 deg	30th: 0.0%, 31 deg
31st: 0.2%, 40 deg	32nd: 0.0%, 163 deg	33rd: 0.1%, 80 deg
34th: 0.0%, 20 deg	35th: 0.1%, 190 deg	36th: 0.0%, 319 deg
37th: 0.2%, 310 deg	38th: 0.0%, 182 deg	39th: 0.1%, 198 deg
40th: 0.0%, 7 deg	41st: 0.1%, 143 deg	42nd: 0.0%, 307 deg
43rd: 0.1%, 98 deg	44th: 0.0%, 0 deg	45th: 0.1%, 55 deg
46th: 0.0%, 309 deg	47th: 0.1%, 244 deg	48th: 0.1%, 214 deg
49th: 0.1%, 285 deg	50th: 0.1%, 203 deg	

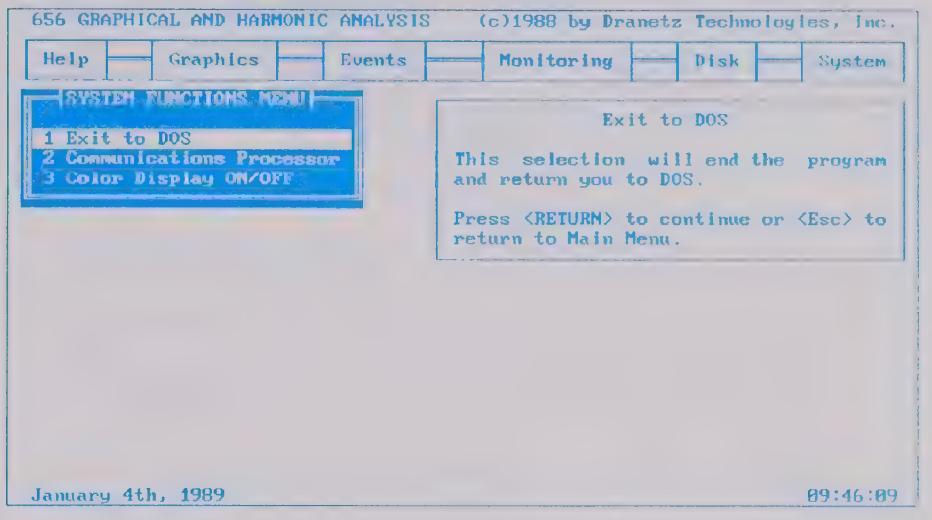
T.H.D.: 22.5% ODD CONTRIB.: 22.5% EVEN CONTRIB.: 0.5%
Frequency: 60.0 Hz
December 7th, 1988 16:53:09

Select "eXit" to return to viewing the original waveform and the Harmonic Selection Screen. Select "exit" a second time to return to the Event Screen. Select "eXit" a third time to return to the Main Menu.

ENDING THE SESSION

To end the session, select "System" from the Main Menu. The System Menu appears:

System Menu



Select Choice number 1, "Exit to DOS", and the program automatically returns you to the DOS prompt.

REFERENCE

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- **USING A MOUSE**
  - **The Main Menu**
  - **The Pull Down Menus**
  - **Special Screen Menus**
- **USING THE KEYBOARD**
  - **The Main Menu**
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ABOUT THE MENUS

There are different ways of selecting an option from the program menus, depending on the type of menu you are selecting from and whether you are using a mouse† or the keyboard. The Main Menu stays on the screen during the pull down menus, but you must exit out of the pull down menu before selecting another option from the Main Menu. (The Help option is an exception to this.)

USING A MOUSE

A mouse can speed operation of the program. The following three Subsections describe how to use a mouse to control the various menus.†

The Main Menu

From the Main Menu, you select an option by positioning the mouse cursor on the desired option and then clicking the left mouse button.

The Pull Down Menus

From any of the pull down menus, you select an option by first highlighting that option and then accepting it.

You can highlight the option by positioning the mouse cursor on the desired option and then clicking the left mouse button‡. Keeping the mouse cursor within the highlight, click the left mouse button a second time to accept the option.

Once you are through with the option you have selected, clicking the right mouse button returns you to the next higher menu selection. You can repeat this until you return to the Main Menu.

Special Screen Menus

Special screens, such as the event screen and the harmonic screen, are accompanied by a menu. To select an option from one of these menus, click the left mouse button once over the option. You may be prompted for additional input.

To exit from one of the special screens, select "eXit" from that screen's menu.

USING THE KEYBOARD

The following Subsections describe how to use the keyboard† to control any of the various menus.

†If you are using a mouse, the keyboard options are also available to you.
‡The first option listed in most of the pull down menus is highlighted when you enter the menu. You can also highlight the option using the keyboard. In these cases, the first click of the left mouse button selects that option.

The Main Menu

From the Main Menu, you select an option by pressing the letter on the keyboard corresponding to the capitalized letter of the desired option.

The Pull Down Menus

From any of the pull down menus, you select an option by first highlighting the option and then accepting it.

You can highlight the option using the cursor keys (up and down arrows), or by pressing the number on the keyboard corresponding with the desired option number in the menu list. After highlighting the option, accept it by pressing *<ENTER>*.

Once you are finished with the option you have selected, pressing *<ESC>* returns you to the next higher menu selection. You can repeat this until you return to the Main Menu.

Special Screen Menus

Special screens, such as the event screen and the harmonic screen, have a menu accompanying the screen. To select an option from one of these menus, press the letter corresponding with the capitalized letter of the option. You may be prompted for additional input.

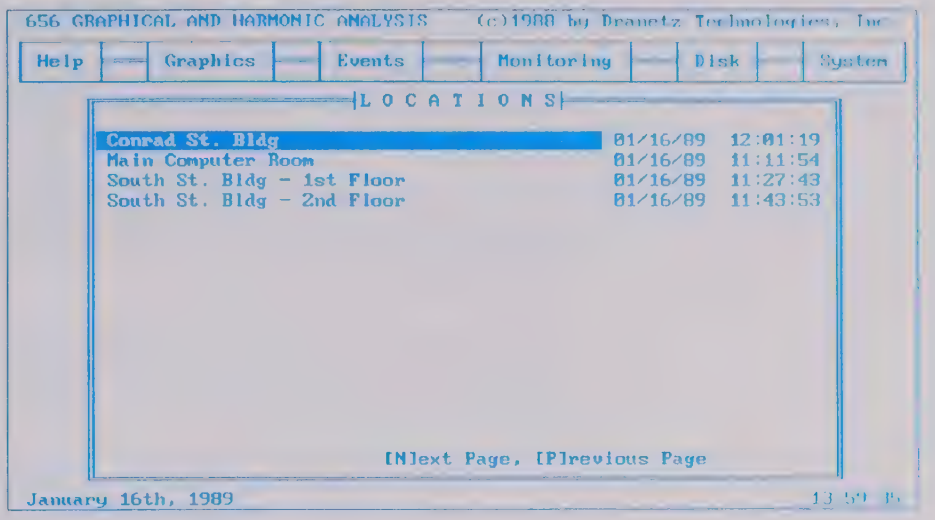
To exit from one of the special screens, select "eXit" from that screen's menu.

LOCATIONS LIST

The Locations List (top of next page) appears every time you select "Graphics", "Events", "Monitoring", and certain functions under "Disk". The Locations List contains an alphabetical and chronological listing of all the files† transferred from the 656 to the Hard Disk (or to the PC Data Disk if using a double diskette system). You select a location file from the list the same as you select an option from a pull down menu.

†If no files are on the disk, the message "No locations on file" appears.

Locations List

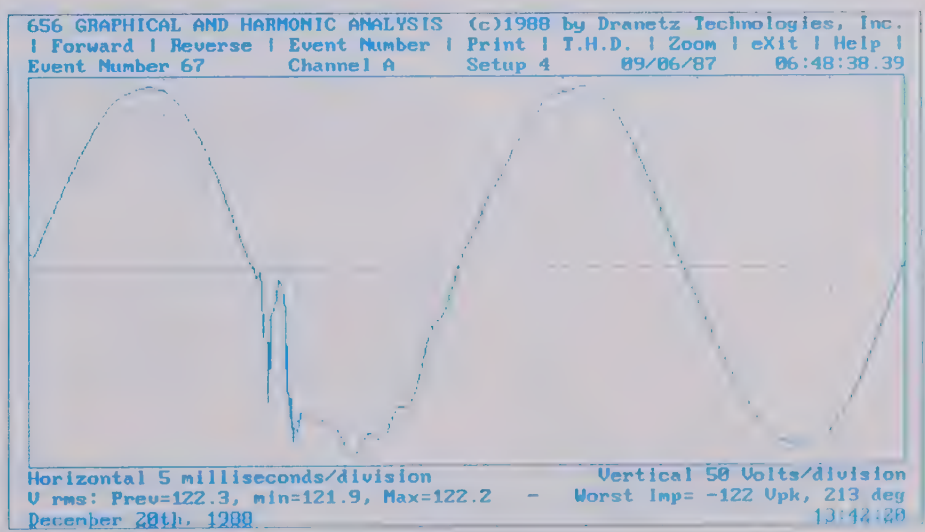


Up to 15 files can fit on each "page" of the Locations List. When the first page is full, a second page is automatically started. The bottom of each page provides the option of going to the previous or next page. The number of pages available depends on the size of the files and the amount of room on your disk.

EVENT SCREEN

You can select to view individual event screens through either the "Events" or "Graphics" options from the Main Menu. When you exit out of the event screen you are returned to the Main Menu.

Waveform Event Screen


656 GRAPHICAL AND HARMONIC ANALYSIS (c)1988 by Dranetz Technologies, Inc.
| Forward | Reverse | Event Number | Print | T.H.D. | Zoom | eXit | Help |
Event Number 67 Channel A Setup 4 09/06/87 06:48:38.39
Horizontal 5 milliseconds/division Vertical 50 Volts/division
V rms: Prev=122.3, min=121.9, Max=122.2 - Worst Imp= -122 Vpk, 213 deg
December 20th, 1988 13:42:20

You select items from the top of the screen by pressing the letter on the keyboard corresponding with the capitalized letter of the desired option, or by positioning the mouse cursor over the desired option and clicking the left mouse button.

Although all of the menu items appear above each type of event, certain functions (such as "Zoom" and "T.H.D.") can only be performed on waveform events.

The events are displayed exactly the same as they appear on the 656 screen. The menu commands are also similar to the 656. The differences are listed below.

1. The "Undo" option is not available. Use *<ESC>* or the left mouse button to undo zooms.

2. The "Zoom" feature differs in how you define the zoom box, and how you "Undo" a zoom.†

3. The "T.H.D." option lets you analyze the harmonic distortion of a line frequency cycle of the event waveform.†

4. The "Print" option lets you print the screen image or save the image in a file on the disk.†

5. The text appears on the screen with the waveform event.

6. The function performed by the "eXit" option depends on whether you are viewing a complete waveform event or a zoomed portion of that event.

   When viewing the complete waveform event, select "eXit" from the event menu to leave the event screen and return to the Main Menu.

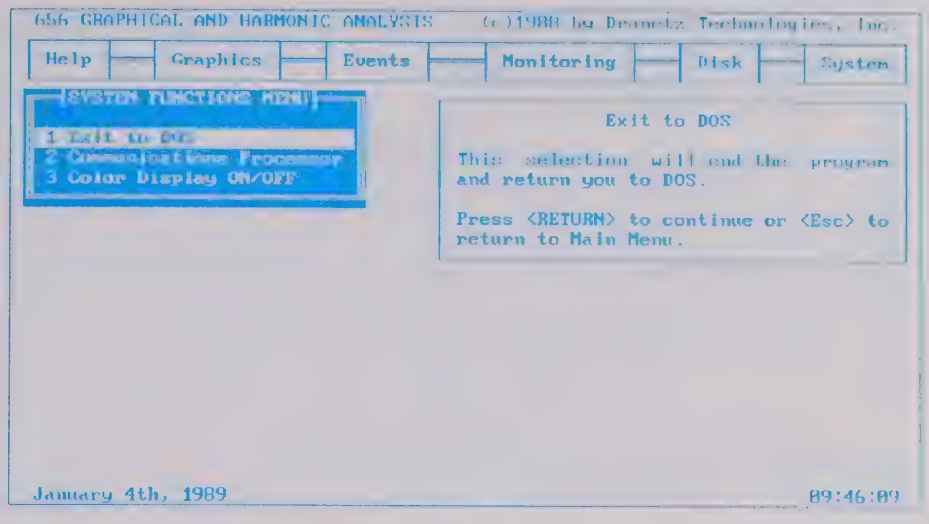
   When viewing a zoomed portion of the event waveform, select "eXit" from the Event Menu to return to the complete waveform. (To exit quickly to the Main Menu before the waveform is completely drawn, use *<ESC>*. After the waveform is drawn, use "eXit" to return to the Main Menu.)

EXITING THE PROGRAM

To end the session, select "System" from the Main Menu. The System Menu appears (top of next page).

†For more information on Zoom, Harmonic Analysis, or Print, refer to the appropriate REFERENCE subsections.

System Menu



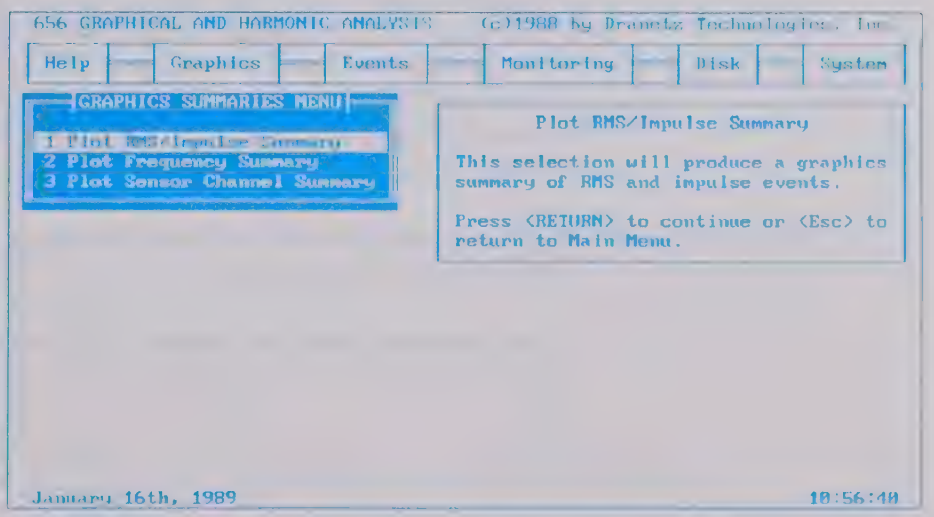
Select choice number 1, "Exit to DOS", and the program automatically returns you to the DOS prompt.†

GRAPHICS

The "Graphics" option displays a time plot of recorded events, and also allows you to view individual events.

The Locations List appears when you select "Graphics" from the Main Menu. Upon selecting a location file, you are presented with the Graphic Summaries Menu.

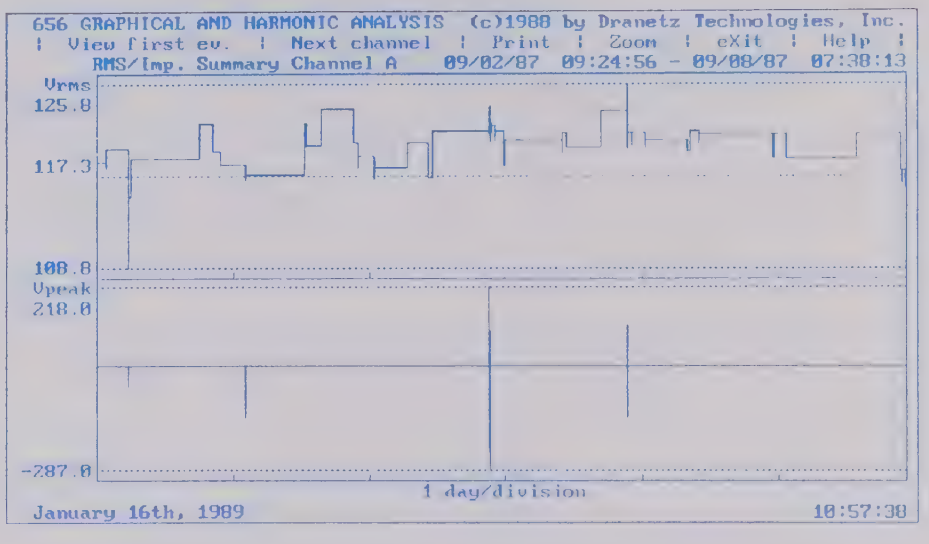
Graphic Summaries Menu



†If a temporary file was created during communications and still exists as a temporary file, you cannot select "Exit". Instead, select choice number 2, "Communications processor". When the Locations Menu appears, either remove the temporary file or save it to a permanent file. You can now exit the program.

Once you choose the type of summary to display, the Graphic Screen appears:†

Graphics Screen



The graph is broken into time increments proportional to its overall time span and size. These increments appear on the bottom of the graph. Depending on your file, this graph can be up to one year.

NOTE: If the file is longer than 1 year, only the first year appears on the graph, and a message appears telling you that this is a partial plot.

From the Graphics Screen Menu, you can choose to view individual events, change the channel that's plotted, print the plot, or zoom in on a smaller period of time and re-plot the graph.

If you choose to view individual events, the first event displayed is the first event in the window.

You can zoom in up to 20 times. The minimum time span that can appear on the screen is one minute‡.

†If the file does not contain any of the type of events you chose, a message appears telling you so.
‡Six 10-second divisions appear on the screen.

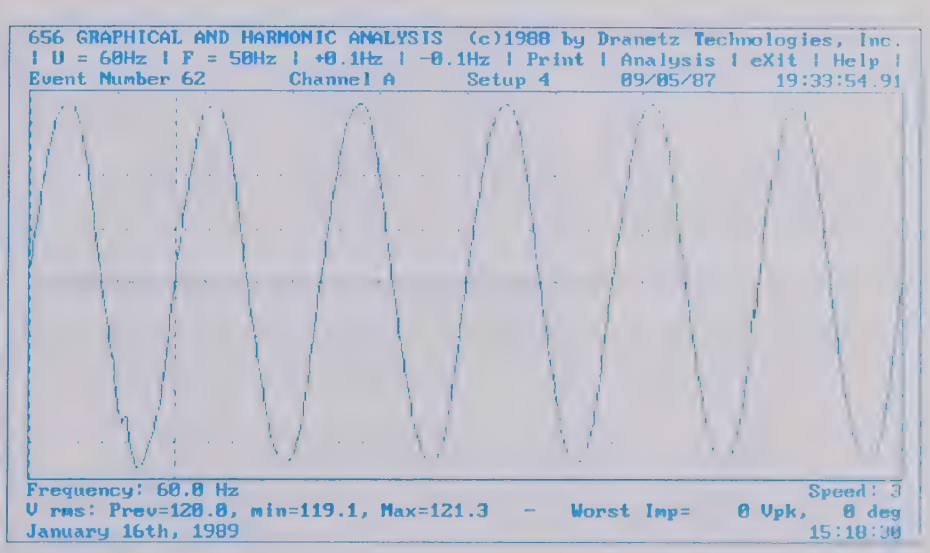
HARMONIC ANALYSIS

Harmonic Analysis can be performed on waveform events to let you know the percent of distortion and where the distortion occurred. (This is an overall picture of the complete waveform. Don't confuse it with short disturbances such as spikes.)

From the Event Screen Menu, select "T.H.D.". This lets you choose one complete cycle to analyze. The complete waveform is displayed on the screen (even if you were previously in a zoomed portion of the waveform), and two vertical dashed lines (markers) appear over the waveform. The first marker is at the beginning of the screen. The second is one complete 60 Hz cycle following the first.

The default frequency is 60 Hz (standard in U.S.). Most foreign countries use 50 Hz, and you can change the setting by selecting "F" from the Harmonic Menu.

T.H.D. Selection Screen


656 GRAPHICAL AND HARMONIC ANALYSIS (c)1988 by Dranetz Technologies, Inc.
U = 60Hz F = 50Hz +0.1Hz -0.1Hz Print Analysis eXit Help
Event Number 62 Channel A Setup 4 09/05/87 19:33:54.91
Frequency: 60.0 Hz
V rms: Prev=120.0, min=119.1, Max=121.3 - Worst Imp= 0 Vpk, 0 deg
January 16th, 1989

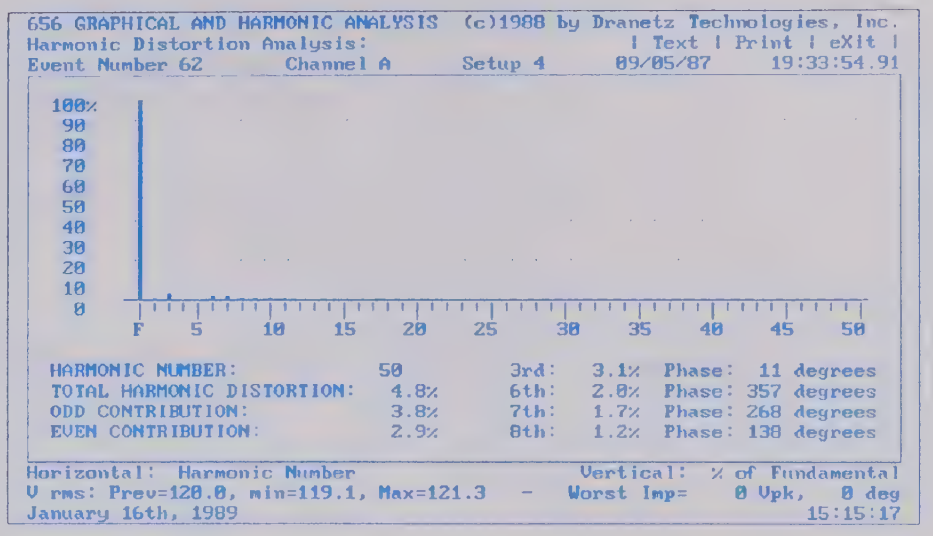
To allow for any distortion, you can change the span of the cycle box between 45 and 65 Hz, in 0.1Hz increments. This can be done 0.1 Hz at a time using the <+> or <−> keys, or can be done all at once using the left mouse button†. All changes to the width of the cycle box are done to the left marker.

Moving the right marker moves the complete box. This can be moved with the right and left cursor keys or the left mouse button.

†Similar to zooming.

Once you have identified the cycle you want analyzed, select "Analyze" from the Harmonic Menu. A screen similar to the one below appears, showing the amplitude of the disturbance (if any) in the various harmonics. The first harmonic is the fundamental, and the amplitude should read 100%.

Harmonic Analysis Screen


656 GRAPHICAL AND HARMONIC ANALYSIS (c)1988 by Dranetz Technologies, Inc.
Harmonic Distortion Analysis:
| Text | Print | eXit |
Event Number 62 Channel A Setup 4 09/05/87 19:33:54.91
100%
90
80
70
60
50
40
30
20
10
0
F 5 10 15 20 25 30 35 40 45 50
HARMONIC NUMBER: 50 3rd: 3.1% Phase: 11 degrees
TOTAL HARMONIC DISTORTION: 4.8% 6th: 2.0% Phase: 357 degrees
ODD CONTRIBUTION: 3.8% 7th: 1.7% Phase: 268 degrees
EVEN CONTRIBUTION: 2.9% 8th: 1.2% Phase: 138 degrees
Horizontal: Harmonic Number Vertical: % of Fundamental
V rms: Prev=120.0, min=119.1, Max=121.3 - Worst Imp= 0 Vpk, 0 deg
January 16th, 1989 15:15:17

Below the chart is some text. "Harmonic number" indicates the number of the harmonic that the program has completed analyzing. When this number reaches 50, the analysis is complete.

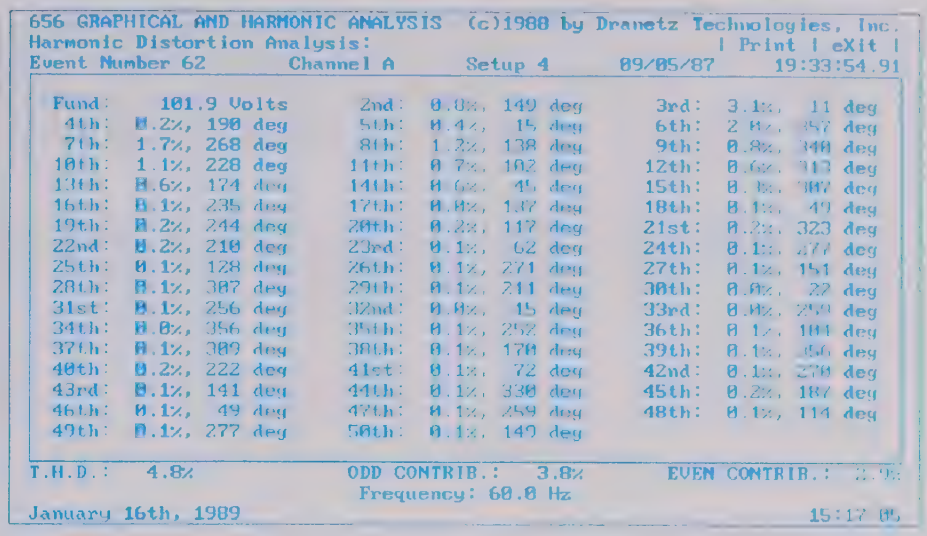
Don't be alarmed that odd and even contribution added together don't equal the Total Harmonic Distortion. The numbers aren't supposed to be summed. If you apply the Pythagorean theorem you will find that:

$$(\text{odd contribution})^2 + (\text{even contribution})^2 = (\text{total distortion})^2$$

To the right of the information on the percent of distortion, listed in order of severity, are the harmonics where the most distortion occurred. The amplitude and the phase shift of each harmonic is listed next to it.

Selecting "Text" presents you with a screen such as the one that follows (top of next page).

Harmonics Text Screen


656 GRAPHICAL AND HARMONIC ANALYSIS (c)1988 by Dranetz Technologies, Inc.
Harmonic Distortion Analysis:
| Print | eXit |
Event Number 62 Channel A Setup 4 09/05/87 19:33:54.91
Fund: 101.9 Volts
2nd: 0.0%, 149 deg
3rd: 3.1%, 11 deg
4th: 0.2%, 190 deg
5th: 0.4%, 15 deg
6th: 2.8%, 357 deg
7th: 1.7%, 268 deg
8th: 1.2%, 138 deg
9th: 0.8%, 340 deg
10th: 1.1%, 228 deg
11th: 0.7%, 102 deg
12th: 0.6%, 113 deg
13th: 0.6%, 174 deg
14th: 0.6%, 45 deg
15th: 0.5%, 307 deg
16th: 0.1%, 235 deg
17th: 0.8%, 147 deg
18th: 0.1%, 49 deg
19th: 0.2%, 244 deg
20th: 0.2%, 117 deg
21st: 0.2%, 323 deg
22nd: 0.2%, 210 deg
23rd: 0.1%, 62 deg
24th: 0.1%, 277 deg
25th: 0.1%, 128 deg
26th: 0.1%, 271 deg
27th: 0.1%, 151 deg
28th: 0.1%, 307 deg
29th: 0.1%, 211 deg
30th: 0.0%, 22 deg
31st: 0.1%, 256 deg
32nd: 0.0%, 15 deg
33rd: 0.0%, 299 deg
34th: 0.0%, 356 deg
35th: 0.1%, 252 deg
36th: 0.1%, 104 deg
37th: 0.1%, 309 deg
38th: 0.1%, 170 deg
39th: 0.1%, 356 deg
40th: 0.2%, 222 deg
41st: 0.1%, 72 deg
42nd: 0.1%, 270 deg
43rd: 0.1%, 141 deg
44th: 0.1%, 330 deg
45th: 0.2%, 187 deg
46th: 0.1%, 49 deg
47th: 0.1%, 259 deg
48th: 0.1%, 114 deg
49th: 0.1%, 277 deg
50th: 0.1%, 149 deg
T.H.D.: 4.8%
ODD CONTRIB.: 3.8%
EVEN CONTRIB.:
Frequency: 60.0 Hz
January 16th, 1989
15:17:00

Each harmonic is listed with its amplitude and phase shift. The total harmonic distortion, including the even and odd contribution, are shown again at the bottom of the screen.

Selecting "eXit" from the Harmonic Analysis Screen or from the Harmonic Text Screen returns you to the Harmonic Selection Screen. Selecting "eXit" from the Harmonic Selection Screen returns you to the Event Screen.

A "Print" selection is also available on each of the Harmonic Screens. (See the REFERENCE subsection for information on "Print".)

HELP

The Dranetz 656 Graphical and Harmonic Analysis Software is equipped with 2 different on-line help features. The first feature is for use with the pull down menus, the second is for use with special screen menus, such as the event and Harmonic screens.

FOR PULL DOWN MENUS

Each time the program is started, the first Help feature is enabled. When you highlight an item from one of the pull down menus, a box of text appears next to the menu describing the highlighted feature. This Help feature is toggled on and off by selecting "HELP" from the Main Menu. Turning it off suppresses the help boxes. A beep sounds each time you toggle this feature on or off†. A temporary message appears in the lower right hand corner of the screen, indicating whether the Help feature was just turned on or off.

†This lets you know if you inadvertently turn the help feature on or off.

If the Help feature is disabled, you can get help on a particular item in any of the pull-down menus by first highlighting that item and then selecting "Help". (The Main Menu is always visible from the pull-down menus, although "Help" is the only function you can access.)

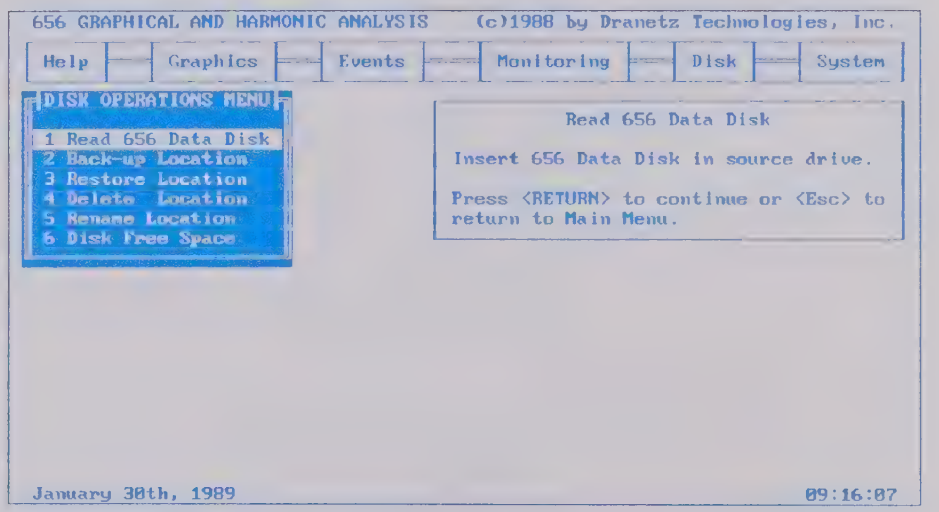
FOR SPECIAL SCREEN MENUS

The help feature associated with the special screen menus is different than the one described above. When you select the "Help" option from the menu at the top of the screen, the help screen replaces the entire screen and briefly describes all of the features in the menu. If more than one page is needed, pressing any key advances you to the next page. Pressing any key from the last page returns you to the original screen.

MANAGING FILES

Upon selecting "Disk" from the Main Menu, you are presented with the Disk Operations Menu:

Disk Operations Menu



This is used for reading in a 656 Disk or for file maintenance. A description of each option follows.

READ 656 DISK

This selection allows you to read in information from the 656 Disk directly to your PC. The advantage of transferring the file this way as opposed to remote communications is the amount of time you save. This option is covered under "Reading Disk" in the REFERENCE section of this manual.

BACKUP LOCATION

This selection allows you to back up the location file from the hard disk (or floppy disk) to a diskette. (If you try to back up a location file using DOS, the backed up file cannot be accessed by the program, since DOS does not preserve the index pointers used by the program.)

After selecting "Backup Location", the points list appears. Select the file you wish to back up and you are prompted for the destination drive. The data file and its associated index files are backed up to the drive you indicate, and you are returned to the Disk Operations Menu.

NOTE: Do not backup more than one data file onto the same diskette. If a backed up file already exists on the diskette, the second file overwrites the first one.

RESTORE LOCATION

This selection allows you to restore a location file to the hard disk (or data disk) after it has been backed up to a diskette and deleted from the hard disk (or data disk). (If you try to restore a location file using DOS, you lose the index pointer the program needs to access the file.)

After selecting "Restore Location", you are prompted for the source drive. The data file and its associated index files are restored from the drive you indicate.

NOTE: If you restore a file that already exists on your hard disk, two identical files with the same name, date, and time appear in your points list. Delete the duplicate location.

DELETE LOCATION

Deletes a location file from the hard disk (or data disk). Once deleted, the events recorded in that file are gone. (If you delete a file using DOS, the file name still appears in the Locations List. Selecting a deleted file from the list will cause the system to crash.)

After selecting "Delete Location", the points list appears. Select the file you wish to delete. The computer beeps and a message appears telling you the file has been deleted. You are then returned to the Disk Operations Menu.

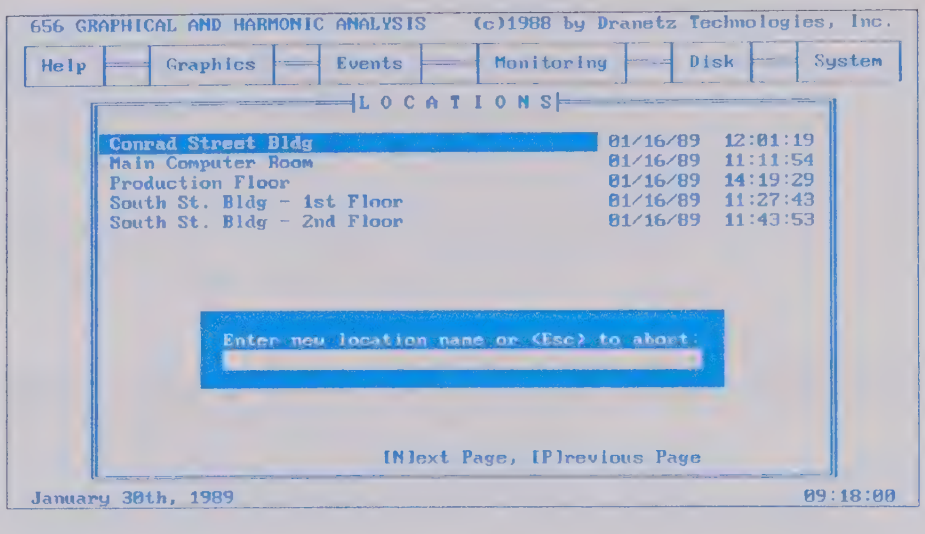
NOTE: Once a file is deleted it is gone. If you think you may wish to access the file at some future point, be sure to back it up on a diskette BEFORE deleting it.

RENAME LOCATION

This option helps you manage your files by allowing you to change the name (or spelling) of a location file.

After selecting "Rename Location", the points list appears. Select the file you wish to rename and a screen such as the following appears, prompting you for a new location name.

Computer Display


656 GRAPHICAL AND HARMONIC ANALYSIS (c)1988 by Dranetz Technologies, Inc.
Help
Graphics
Events
Monitoring
Disk
System
L O C A T I O N S
Conrad Street Bldg 01/16/89 12:01:19
Main Computer Room 01/16/89 11:11:54
Production Floor 01/16/89 14:19:29
South St. Bldg - 1st Floor 01/16/89 11:27:43
South St. Bldg - 2nd Floor 01/16/89 11:43:53
Enter new location name or <Esc> to abort:
[N]ext Page, [P]revious Page
January 30th, 1989
09:18:00

Type in a new name and press <*ENTER*>. The file name is changed (but the time and date remain the same) and you are returned to the Disk Operations Menu.

DISK FREE SPACE

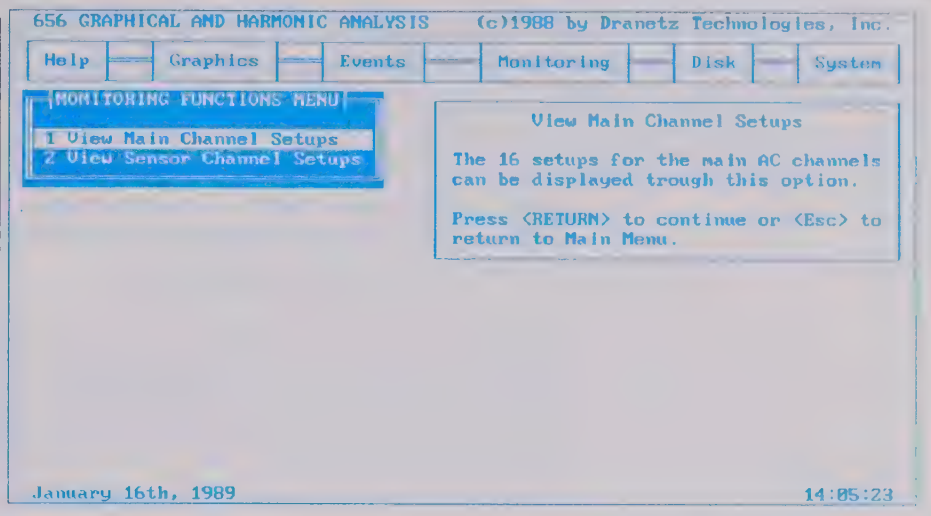
Selecting this option tells you how much space is available on the disk on the default drive. If you are running the program from a floppy drive, you can alternate PC Data Disks to find the one with the most available space.

MONITORING

This selection lets you view the channel setups for the location file you select. This feature is not available for events recorded using a 656 program diskette prior to Version 1.42, unless setups were saved to the same disk as the events using the "Save setups" command from the 656.

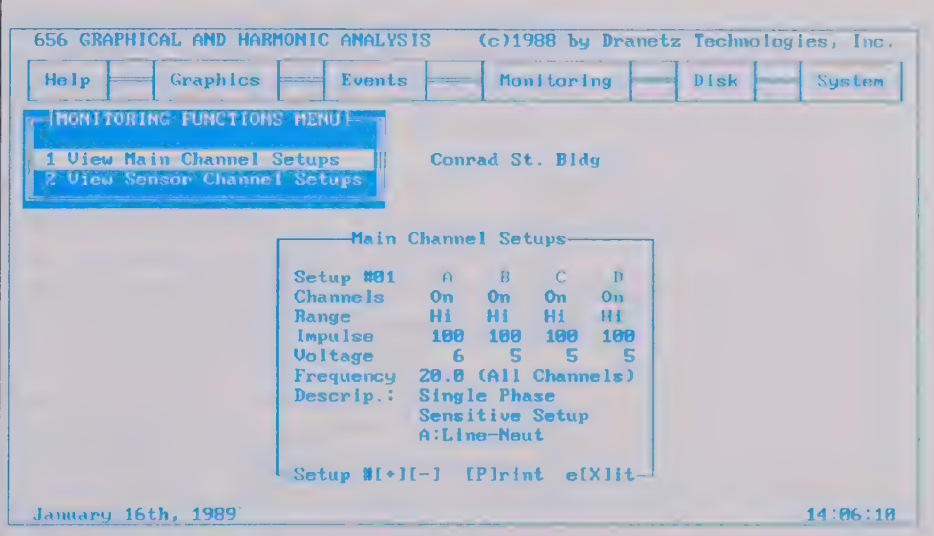
When you select "Monitoring" from the Main Menu, the Locations List appears. Once you select a location file, the Monitoring Functions Menu appears (top of next page).

Monitoring Functions Menu


656 GRAPHICAL AND HARMONIC ANALYSIS (c)1988 by Dranetz Technologies, Inc.
Help
Graphics
Events
Monitoring
Disk
System
MONITORING FUNCTIONS MENU
1 View Main Channel Setups
2 View Sensor Channel Setups
View Main Channel Setups
The 16 setups for the main AC channels can be displayed trough this option.
Press <RETURN> to continue or <Esc> to return to Main Menu.
January 16th, 1989
14:05:23

Make a selection to view the setups for either the Main or Sensor channels. A box similar to the following appears on the screen, allowing you to view the setups (by number) that were in effect when the location file you selected was transferred.

Monitoring Menu with Setup Box†



The name of the file appears above the setup box. Use the <+> and <–> keys (or the mouse) to change the displayed setup to the setup you want to view. (The event screen shows the number of the set-up that was active when the event was recorded.)

†The Main Channel Setups screen illustrated is that of the 656; the 656A screen will be slightly different.

To print the file name and the information inside the setup box, select "[P]rint". To return to the Monitoring Functions Menu, select "e[X]it".

PRINTING

From any of the event screens, you can choose this option and print the whole screen image†. This image can either be printed out as a hard copy, or printed to the disk (hard disk or PC Data Disk) to be saved and printed at a later time.

Events can either be printed as a hard copy or to the disk. Events printed as a hard copy can be inserted into a field report. Events printed to the disk can be called up and printed at a later time. In this way you can selectively save events from a file.

TO A PRINTER

The Dranetz 656 Graphical and Harmonic Analysis Software program is designed to work with an Epson® (or compatible) dot matrix printer.

To print, you must see the event (graphic illustration, text, or harmonic analysis) to be printed on the screen. Make sure the printer is turned on and properly loaded. Select "Print" from the menu above the event.

The menu is replaced with the name of the location file the event is located on. A prompt for the file name appears at the bottom of the screen. Ignore this prompt and press <*ENTER*>. Everything on the screen, with the exception of the bottom line, is printed.

TO THE DISK

Printing an event to the disk lets you save the event screen image for later use. You are given the choice of saving the file in one of two different formats: ".PCX" (reduced or full) or ".GRA". The choice you make depends on how you intend to use the image.

The ".GRA" format can be printed through DOS. The ".PCX" format is compatible with popular outside software, such as Microsoft® Windows and Microsoft® Paintbrush. Through these programs, text and graphics can be added to the event before it is printed. The image can also be clipped, shrunk, and printed in a finished report.

To print to the disk, you must see the event (graphic illustration, text, or harmonic analysis) to be printed on the screen. The image on the screen is printed to a file on the drive the program is running from.‡

†The menu options are replaced with the name of the file the event is located on. The current time and date, displayed at the bottom of the screen, are not printed.

‡If using a hard disk system the image file is copied to the program directory. If using a double diskette system it is printed to the root directory. You can copy or delete image files through DOS.

Select "Print" from the menu above the event. The menu is replaced with the name of the location file the event is located on. A prompt appears at the bottom of the screen to enter a file name. Type a file name in standard DOS format (up to eight characters, no punctuation marks or spaces). Press *<ENTER>*.

A new prompt appears on the bottom line:

[R]educed PCX [F]ull PCX or [G]raphics ?

If you intend to import the screen image into certain software programs, you need to save it in ".PCX" format. (Refer to your outside software program's manual to see which ".PCX" format is better for your needs.) If you merely want to save the screen image to print out later through DOS, save it in ".GRA" format.

Once you choose, press *<ENTER>*. Everything on the screen, with the exception of the bottom line, is printed to the disk.

FROM THE DISK

Using DOS

When you print an image file using DOS, you are copying the file to the printer.†

For these instructions, the image file you want to print must be on the drive and directory you are currently in. Replace the name of the file you wish to print, where **NAME** appears in the examples below.

At the DOS prompt type: **COPY /B NAME.GRA PRN**
Press *<ENTER>*

If more than one file is to be printed, wildcard characters ("*", "?") may be used in the file name. For example, **COPY /B *.GRA PRN** or **COPY /B EVENT??.GRA PRN**.

Using Outside Software

Refer to your outside software's user guide for instructions on how to view or import ".PCX" type of files.

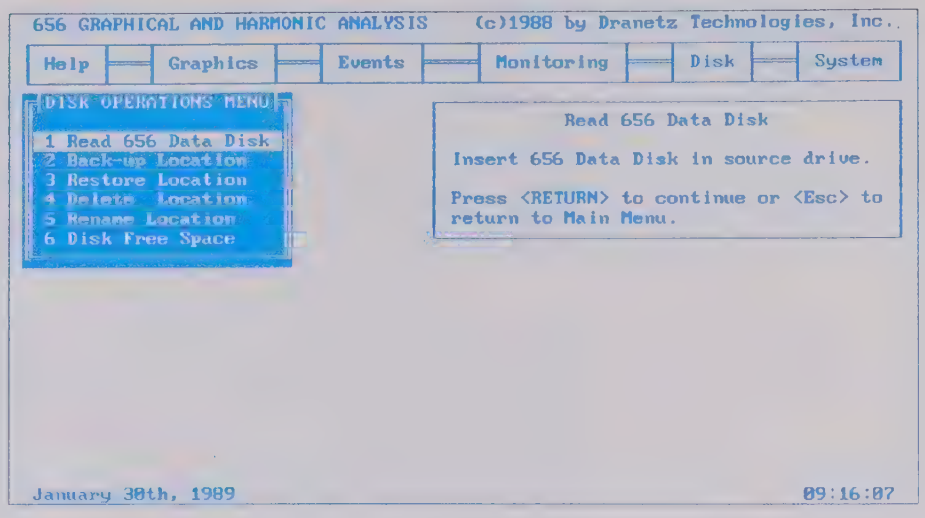
READING DISK

If you intend to transfer data directly from the 656 Disk, you need at least one 3½ inch drive‡.

Select "Disk" from the Main Menu. The Disk Operations Menu appears (top of next page):

†DO NOT use the DOS "PRINT" command for printing ".GRA" files.
‡If you are using a double diskette system and you only have one 3½ inch disk drive, you must be running the program from the other drive.

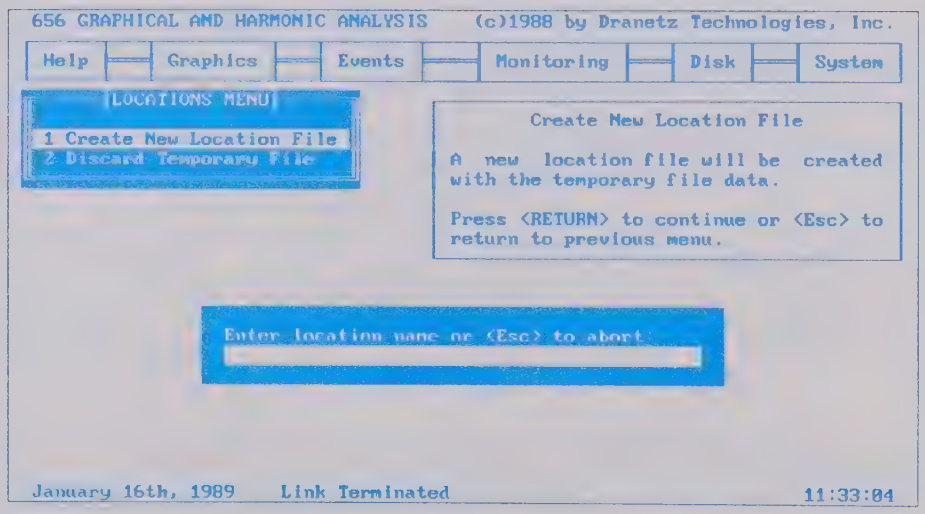
Disk Operations Menu



Select option number 1, "Read 656 Disk". A message appears on the bottom of the screen prompting for the drive letter the disk is to be read from (the default drive is A). Enter the letter and insert the 656 Disk into the appropriate Drive.† Press *<ENTER>*.

The transfer of data to a temporary file takes a few minutes, even if the data file is very large. When the transfer is complete, the Locations Menu appears:

Locations Menu



†If using a double diskette system, make sure your PC Data Disk is in the proper drive before beginning the transfer. DO NOT try to copy the file to Program Disk.

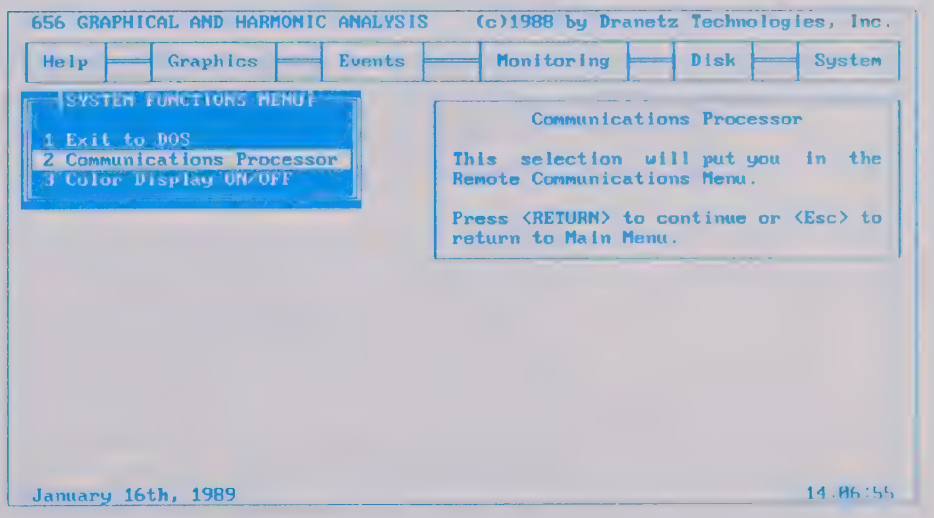
The temporary file you have created must either be saved or deleted before accessing another 656 Disk, starting communications with a remote 656, or exiting the program.

Select option number 1, "Create New Location File", to save the temporary file to a permanent file. When prompted for a file name, enter a name (up to 42 characters long) that will help you know which 656 the data was from. All files from that particular unit should have the same name since the date will distinguish them. The file is automatically assigned the 656 system date at the time the data was saved to the 656 Data Disk.† The files are listed on the Locations List in alphabetical and chronological order.

REMOTE COMMUNICATIONS

Remote communications allows the transferring of events from the 656 memory to a PC either over telephone lines or through a direct serial connection. To begin remote communications, select "System" from the Main Menu. The System Function Menu appears:

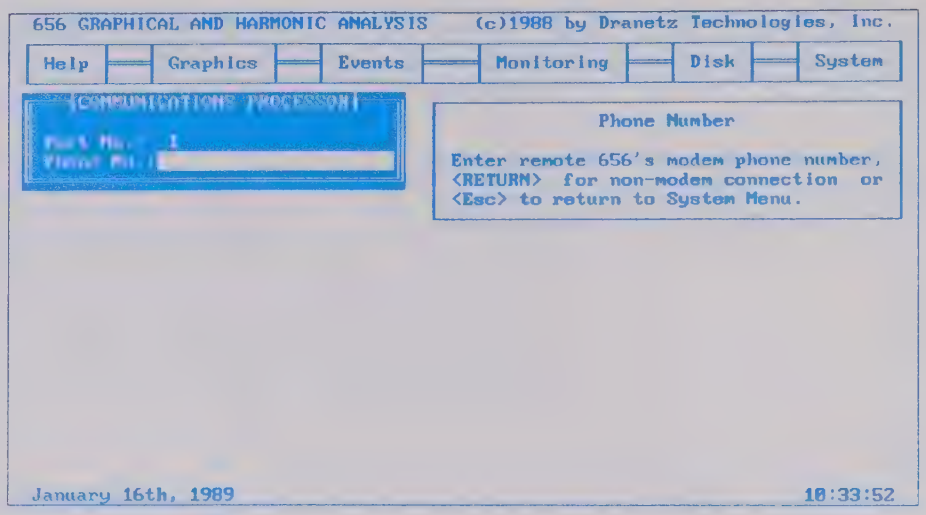
Systems Function Menu



From the System Functions Menu, select choice number 2, "Communications Processor". If running Version 1.2 of the software, the screen on the following page appears. Refer to Appendix C if running Version 2.0 of the software.

†If the disk being read in is from an older version of 656 software (before V1.42), the PC system date at the time the 656 disk is read in is used.

Communications Menu



The default communications port is port 1. Selecting the "Port No.:" option toggles this between port 1 and port 2.

DIRECT SERIAL CONNECTION

If the number displayed in the communications menu is not the number of the port where the serial cable is attached, select "Port No.:" to change the setting. Then select "Phone No.:" twice, without entering a number†. The program contacts the 656.

NOTE: Before remote communications can begin, the 656 must be properly set. To set the 656 for the direct serial transfer, select option number 4, "Start Non-Modem Transmit", from the 656's Remote Communications Menu. When the connection is terminated, the 656 returns to the Remote Communication Menu.

A message appears stating approximately how long the data transfer takes to complete. Press *<C>* to transfer the data to a temporary file on the PC‡, or press *<ESC>* to abort the process.

If you press *<C>*, a message appears telling you that the transfer is in progress. If you decide to terminate the transfer before it's complete, press *<Ctrl>+<X>* twice. Within a few seconds the System Menu appears on the screen. Press *<ESC>* to access the Main Menu.

†If a phone number is entered here the program assumes a modem connection and dials the number. If this line is left blank and selected a second time, the program assumes a direct serial connection and accesses the 656 directly.

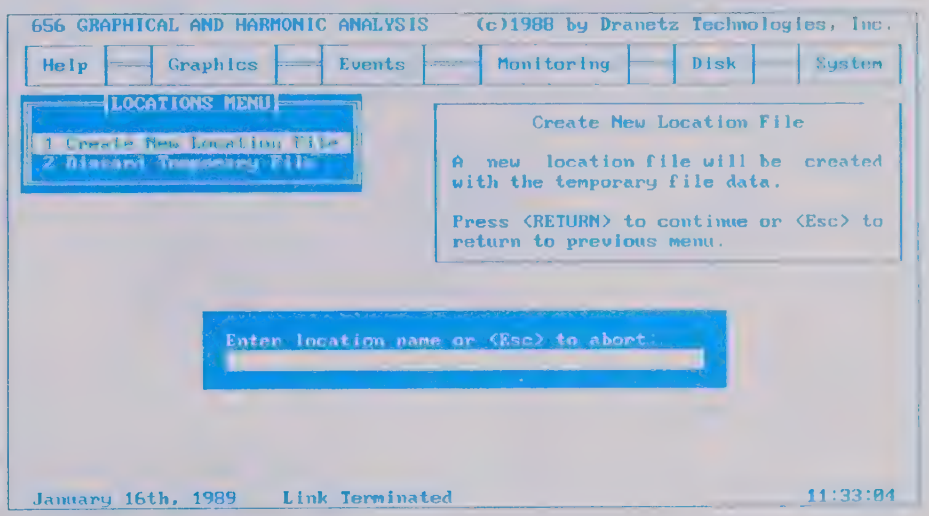
‡If using a double diskette system, make sure your PC Data Disk is in the proper drive before beginning the transfer. DO NOT try to copy the file to the Program Disk.

Since the transfer takes place in "background mode", you can perform other program functions while the transfer is in progress. The bottom line of the screen provides information about the progress of the transfer, and indicates when the transfer is complete.

When the transfer is complete, the communications link is terminated. The temporary file you have created must either be saved or deleted before starting communications with another remote 656, accessing a 656 Disk, or exiting the program.

From the System Menu, select option number 2, "Communications Processor". The Locations Menu appears:

Locations Menu



Select option number 1, "Create New Location File", to save the temporary file to a permanent file. When prompted for a file name, enter a name (up to 42 characters long) that will help you know which 656 the data was from. All files from that particular unit should have the same name since the date will distinguish them. The file is automatically assigned the 656 system date and the files are listed on the Locations List in alphabetical and chronological order.

NOTE: It is important to note that you can't control the 656 settings through remote communications. This can only be done from the front panel of the 656.

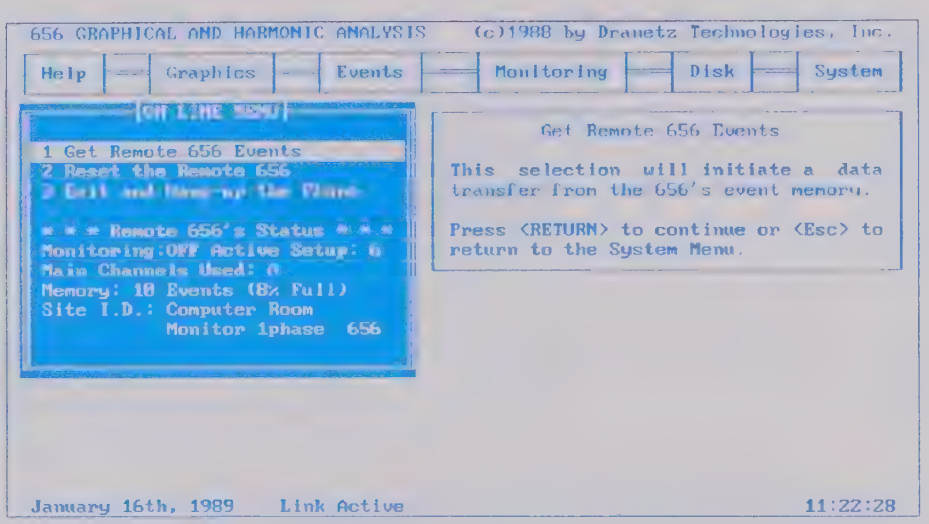
MODEM CONNECTION

If the port number displayed in the communications menu is not the number of the port where the modem is located, select "Port No.:" to change the setting. Then select "Phone No.:" and enter the phone number* of the 656 to be called. Select "Phone No.:" a second time. The program contacts the 656.

NOTE: Before remote communications can begin, the 656 must be properly set. To set the 656 for modem transfer, select option number 1, "Wait for a call" from the 656's Remote Communications Menu.

Once a successful connection is made, the On Line Menu appears:

On-Line Menu


656 GRAPHICAL AND HARMONIC ANALYSIS (c)1988 by Dranetz Technologies, Inc.
Help
Graphics
Events
Monitoring
Disk
System
ON LINE MENU
1 Get Remote 656 Events
2 Reset the Remote 656
* * * Remote 656's Status * * *
Monitoring:OFF Active Setup: 0
Main Channels Used: 0
Memory: 10 Events (8% Full)
Site I.D.: Computer Room
Monitor 1phase 656
Get Remote 656 Events
This selection will initiate a data transfer from the 656's event memory.
Press <RETURN> to continue or <Esc> to return to the System Menu.
January 16th, 1989 Link Active 11:22:28

Communications has an automatic "time out" feature. If you do not select from the On Line Menu within two minutes, communications is terminated. A message appears every 30 seconds, accompanied by a beep, telling you how much time is left before "time out" occurs.

Select option number 1, "Get Remote 656 Events". This transfers the information from the Series 656's event memory into a temporary file on the PC†. (Once the transfer is complete, you can save this temporary file to a permanent file.)

A message appears stating approximately how long the data transfer will take‡. Press <*C*> to continue with the transfer or <*A*> to abort the process.

* If you wish to include a one second pause in your phone number (to wait for a dial tone, for example), use a comma (","). For a longer pause, use more than one comma.

† If using a double diskette system, make sure your PC Data Disk is in the proper drive before beginning the transfer. DO NOT try to copy the file to the Program Disk.

‡ If there is not enough room on the PC disk to receive the file, a message appears telling you so, and the transfer does not take place.

If you press <*C*>, a message appears telling you that the transfer is in progress. If you decide to terminate the transfer before it is complete, press <*Ctrl*>+<*X*> twice. Within a few seconds the System Menu appears on the screen. Press <*ESC*> to access the Main Menu.

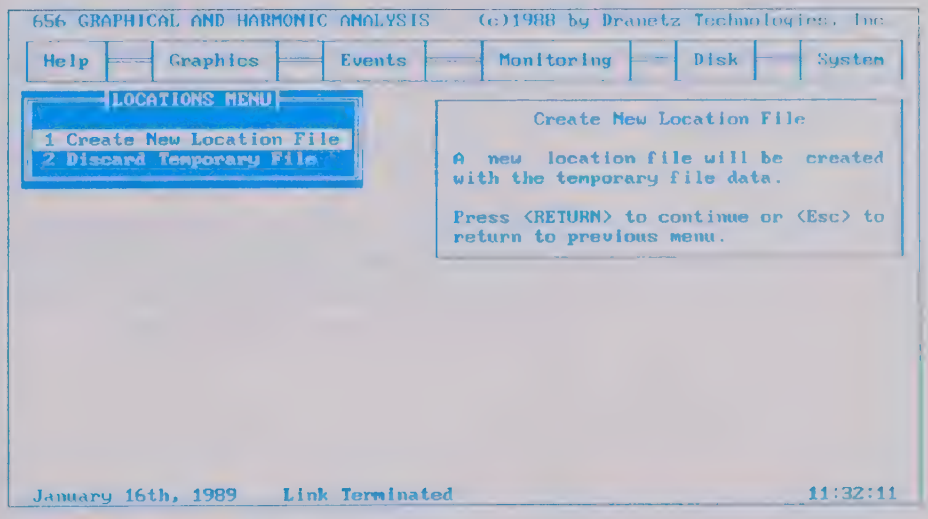
Since the transfer takes place in "background mode", you can perform other program functions while the transfer is in progress. The bottom line of the screen provides information about the progress of the transfer, and indicates when the transfer is complete. (If you do not return to the System Menu within two minutes after the transfer is complete, the communication link is terminated, but the transferred date is still saved to a temporary file.)

After the transfer is complete, select number 2, "Communications Processor", from the System Menu to return to the On-line Menu.†

Since you have retrieved all of the event data from the 656, you may want to reset it, making room for new data. If this is the case, select option number 2, "Reset the Remote 656".

Next, select option number 3, "Exit and Hang-up Phone." When communication is terminated, the Locations Menu appears:

Locations Menu



†If communication has already been terminated, the Locations Menu appears when you select number 2, "Remote Communications" from the Systems Menu.

The temporary file you have created must either be saved or deleted before starting communications with another remote 656, accessing a 656 Disk, or exiting the program. (Be careful not to discard the temporary file if you have reset the 656.)

Select option number 1, "Create New Location File", to save the temporary file to a permanent file. When prompted for a file name, enter a name (up to 42 characters long) that will help you know which 656 the data was from. All files from that particular unit should have the same name since the date will distinguish them. The file is automatically assigned the 656 system date and the files are listed on the Locations List in alphabetical and chronological order.

If you have more than one Series 656, call them all, one at a time, and retrieve all of the event data in this manner. If writing information to a PC Data Disk instead of to the Hard Drive, make sure there is adequate room on the diskette to hold all the information in each of the files before you do each transfer.

NOTE: It is important to note that you can't control the 656 settings through remote communications. This can only be done from the front panel of the 656.

ZOOMING

The "Zoom" feature on the Dranetz 656 Graphical and Harmonic Analysis Software program is similar to the "Zoom" feature on the 656. You can zoom in on a window up to 20 times.

As with the 656, you must first select "Zoom", define your zoom window, and select "Zoom" a second time. The markers (vertical and horizontal dotted lines) that appear on the screen when you select "Zoom" define the Zoom box or window. The instructions below explain how to move the markers to re-define the Zoom window using either the mouse or the keyboard.

WITH A MOUSE

As with the other menus, if you have a mouse installed you can use either the mouse or the keyboard. Defining the zoom window with a mouse is much faster than defining it with the keyboard.

Zooming in

The mouse pointer appears on the screen as a hollow box. Position that box over the marker you wish to move and click the left mouse button. The shape of the mouse pointer now changes. Position the pointer where you want the marker to be, and click the left mouse button. The marker is now at the new location.

You can move two markers at one time by placing the box (mouse pointer) on a corner where two of the markers intersect.

Zooming out

To zoom out one level, click the right mouse button. To zoom back to the original waveform, select "eXit" from the Event Menu.

FROM THE KEYBOARD

Zooming in

You can use the cursor keys to move the vertical and horizontal markers. When you select "Zoom", the word "upper" appears in the lower right corner of the screen. This tells you which marker the cursor keys move. You are able to change the marker by pressing *<SPACE BAR>*. The word "speed" also appears in the lower right hand corner of the screen, followed by a number. This controls the amount of space the markers move. The default speed is 3, but you can change this between 1 (slowest) and 9 (fastest) using the number keys across the top of the keyboard.

Zooming out

To zoom out one level, press the *<ESC>* key. To zoom back to the original waveform, select "eXit" from the Event Menu.

APPENDICES

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CONNECTION TO THE 656

CONNECTION TO THE PC

APPENDIX B: COLOR, RESOLUTION, & GRAPHIC ADAPTORS

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CONFIGURATION

PRINTER PREPARATION

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PROGRAM EXECUTION

APPENDIX A: HARDWARE CONNECTIONS

GENERAL

The following Appendix describes the hardware connections necessary for communication between the Dranetz Disturbance Waveform Analyzer and the PC. You can have up two RS-232 connections if you have two available serial ports. A modem takes up one serial port, as does a serial mouse.

DIRECT SERIAL CONNECTION

For local connections between the PC and the 656, the RS-232 cable supplied with this package (Dranetz P/N 113376-G1) should connect the Main Port on the 656 to the PC serial port (Com1 or Com2). A longer cable (up to 50 feet) can be used for greater distances.

NOTE: The serial cable pinout for the PC to the 656's Main Port is male to female†, with pins 1 through 8 and 20 connected pin to pin.

MODEM CONNECTION

If communication over public access phone lines is desired, both the 656 and the PC must be equipped with modems. The Hayes 1200 Smartmodem® is recommended for use with the 656. Either the Hayes 1200 or 1200B Smartmodem® is recommended for use with the personal computer.

CONNECTION TO THE 656

To set up the Hayes Smartmodem® for use with the 656, set its configuration switches as follows:

Switch	Position	Description
1	Down	DTR Ignored
2	Down	Result codes digitized
3	Down	Result codes displayed
4	Down	Character echo disabled
5	Up	Answer call on the first ring
6	Down	RS-232C carrier detect disabled
7	Up	Single line RJ-11 phone jack
8	Down	Command mode enabled
9	Up	Bell 103/212A mode
10	Up	DTR low = hangup and return to command state

†PC side is female.

Connect the modem to the 656's Main Port using Dranetz cable P/N 113446-G1, or follow the circuit guidelines below:

656 DB25 MALE		Hayes SmartModem® DB25 MALE
1	----------	1
2	----------	3
3	----------	2
7	----------	7

Using an RJ-11C cable, connect the RJ-11C Jack of the Hayes Smartmodem® with an RJ-11 Jack that connects to the public phone lines.

CONNECTION TO THE PC

Hayes Model 1200 B internal Smartmodem®

To set up the Hayes Model 1200 B internal Smartmodem® for use with the PC, set its configuration switches as follows:

Switch	Position	Description
1	Right	Designates Smartmodem® as COM1
	Left	Designates Smartmodem® as COM2
2	Left	Single line telephone jack (RJ11)
3	Right	Carrier detect status enabled
4	Left	DTR low = hangup and return to command state

Hayes Model 1200 external Smartmodem®

To set up the Hayes Model 1200 external Smartmodem® for use with the PC, set the modem configuration switches as follows:

Switch	Position	Description
1	Up	Support DTR
2	Down	Digit result codes
3	Down	Result codes enabled
4	Up	Character echo enabled
5	Down	Don't answer incoming calls
6	Up	RS-232-C carrier detect enabled
7	Up	Single line RJ-11 phone jack
8	Down	Enable command recognition
9	Up	Bell 103/212A mode
10	Up	DTR low = hang up and return to command state

NOTE: The cable provided in this package to connect the PC to the 656 (Dranetz P/N 113376-G1) can be used to connect the modem to the PC since the pin designations are the same (pins 1 through 8 and 20 connected straight through).

APPENDIX B: COLOR, RESOLUTION, & GRAPHIC ADAPTORS

GENERAL

The 656 Graphical and Harmonic Analysis Software has been designed to automatically detect the graphics adapter present in the PC and adjust to the maximum possible resolution.

The table below shows the actual results with the different video cards available from IBM:

Video Card	Memory	Resolution	Color
IBM CGA	16K	640 x 200	NO
IBM EGA	64K	640 x 200	NO
IBM EGA	128K	640 x 200	YES
IBM EGA	256K	640 x 350	YES
IBM VGA	256K	640 x 350	YES

APPENDIX C: VERSION 2.0 AND THE 656A

GENERAL

The 656A Graphical and Harmonic Analysis software retrieves, stores, and analyzes data collected by a Dranetz 656A Disturbance Waveform Analyzer.

Version 2.0 of the Graphical and Harmonic Analysis software has been restructured for the 656A. On the surface, operation of both versions of the software is virtually identical. However, extensive differences in the type of data each unit is capable of handling necessitated two different versions of software.

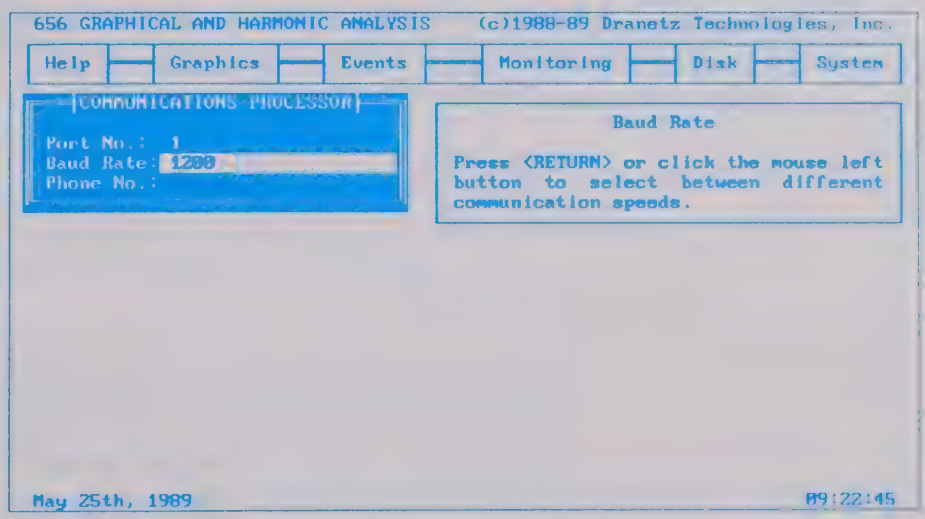
VERSION 2.0 ENHANCEMENTS

In addition to changes needed to handle the new type of event data recorded by the 656A, Version 2.0 has a few features not found in earlier versions. These features include adjustable baud rates in remote communications and an available command line option for initializing modems using software rather than hardware switches.

ADJUSTABLE BAUD RATES

Version 2.0 allows the selection of the following baud rates for communication: 1200, 2400, 4800, 9600. The Communications Menu is different from the Communications Menu of Version 1.2

Version 2.0 Communications Menu



The original default baud rate is 1200. Each time "Baud Rate" is selected from the Communications Menu, the setting changes. Press *<ENTER>* or click the left mouse button until the desired baud rate is displayed. This becomes the new default setting.

COMMAND LINE OPTIONS

When invoking the program one or more options can be added to the command line (for example, "/B" to select monochrome mode). The options tells the program how to behave when running. A new option has been added for initializing modems using software rather than hardware switches.

The proper format for using options with the Graphical and Harmonic Analysis software is to type the command to begin the program, followed by a space, followed by a slash and the option command. If more than one option is to be used, simply add another space, slash and option command. At the end of the line press *<ENTER>*. For example, to boot the program up in monochrome with a default frequency setting of 50 Hz:

Type: **656AGHA /B /F:50**
Press: *<ENTER>*

The order in which the options are typed is irrelevant.

Modem Initialization

A Hayes 1200 (external) or 1200B (internal) Smartmodem is recommended for the PC when performing modem communication with the 656 or 656A. (For the 656, a Hayes 1200 Smartmodem is required; for the 656A, either a Hayes 1200 Smartmodem or a factory installed internal modem is required.)

Remote communication is also possible using a Hayes 2400 Smartmodem. Since the 2400 does not contain hardware switches like the 1200, the modem setup is accomplished by sending a series of commands (initialization string) from the PC to various internal registers in the modem

Certain other modems may also work with the Graphical and Harmonic Analysis software; some of them may also require initialization strings. Consult your modem's manual and use the initialization commands that correspond with the switch settings in Appendix A of the manual.

[1]Modems other than Hayes Smartmodems are not guaranteed to work with the Graphical and Harmonic Analysis software.

In versions 1.x of the Graphical and Harmonic analysis software, this initialization command string must be sent to the modem using any communications terminal package. In version 2.0, an option command is available for entering the initialization string when invoking the program.

The format for the modem switch is a slash followed by the letters "MI" followed by a colon (":") followed by the initialization string enclosed in quotes. A space separates the option command from the command to boot the program and from any other options. For example, to invoke the program and initialize a Hayes 2400 Smartmodem, type:

656AGHA /MI:"AT&D2V0Q0E1S0=0&C0&S0&J0B1L0&W0&Y0"

Press: *<ENTER>*

If the string is not entered, or if it is entered incorrectly, the program sends ATZ as the initialization string.

NOTE: It is not necessary to enter the initialization string again if the last time the modem was initialized it was sent the proper string for the Graphical and Harmonic Analysis software. Since different programs may require different initialization settings, it is necessary to include this option when invoking the program if the settings have been changed for other software.

Using a Batch File

A batch file can be created for invoking the program with the desired options without having to retype the entire command line each time. This is especially useful when using initialization strings. Consult your DOS manual for information on how to create a batch file.

APPENDIX D: HEWLETT PACKARD THINKJET CONFIGURATION

GENERAL

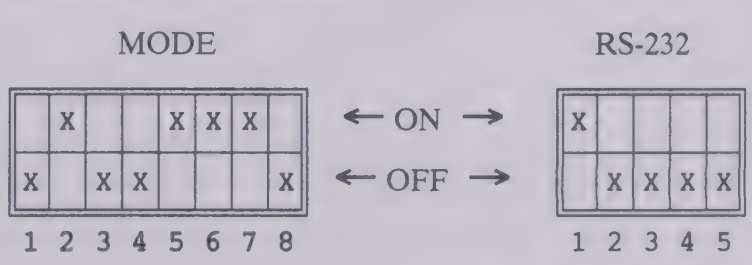
In addition to Epson and IBM printers, Dranetz 656/656A Graphical and Harmonic Analysis Software supports the Hewlett Packard ThinkJet printer. (This printer can also be used as an external printer for the 656 or 656A. Refer to your 656/656A manual for more information.)

CONFIGURATION

In order to be compatible with the Graphical and Harmonic Analysis softwre, the ThinkJet must first be set up properly.

PRINTER PREPERATION

Connect the ThinkJet to one of the PC's serial ports using a Hewlett Packard serial cable (Hewlett Packard part number 13242-60011). Set the ThinkJet's DIP switches as follows:



PC PREPERATION

BEFORE running the Graphical and Harmonic Analysis software, the following DOS commands must be executed (replace "**n**" in the example below with the number of the PC serial port to which the printer is connected). At the DOS prompt,

type: **MODE COMn:9600,N,8,1,P** press <*ENTER*>
type: **MODE LPT1=COMn** press <*ENTER*>

PROGRAM EXECUTION

Run the Graphical and Harmonic Analysis program as usual. If all of the above steps were properly followed, the output to the printer will automatically be re-directed to the ThinkJet.

NOTE: Due to the difference in resolution (dots per inch) between the Hewlett Packard ThinkJet and an Epson or IBM dot matrix printer, the images printed by the different printers will not be the same size.

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IBM PC, PC XT
360 KB
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Graphical and Harmonic Analysis Software
656-OS-2001
VERSION 2.01
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